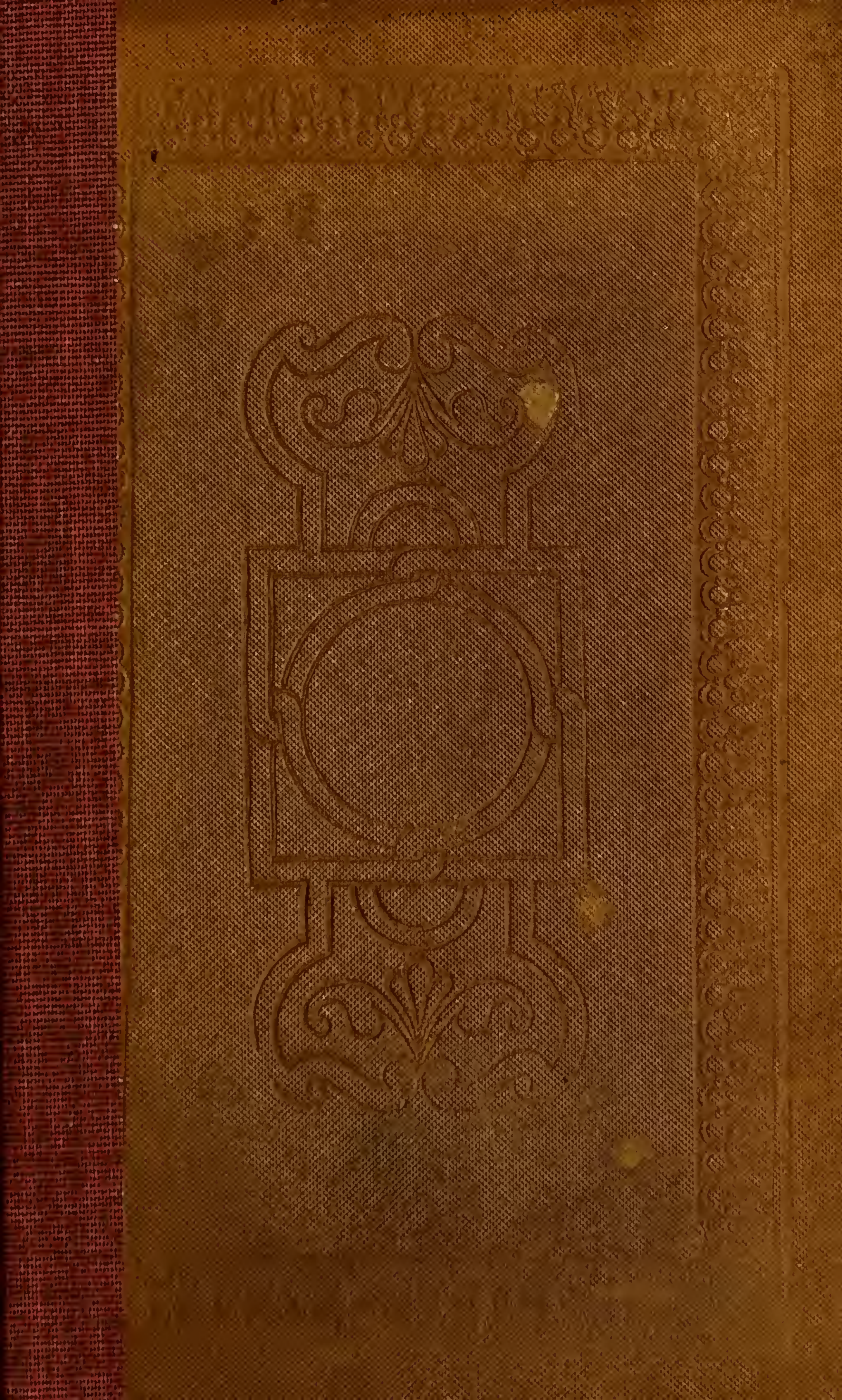

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ON

THE PRESERVATION

OF

THE HEALTH

OF

BODY AND MIND.

BY

FORBES WINSLOW,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS OF LONDON;
AUTHOR OF "THE ANATOMY OF SUICIDE," ETC.

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TO

SIR JAMES CLARK, BART., M.D., F.R.S.

PHYSICIAN IN ORDINARY TO THE QUEEN,

AND TO THE PRINCE ALBERT,

&c. &c. &c.

Dear Sir,

I feel much honoured by your kind permission to bring out this little work under your distinguished auspices.

I cannot do so without availing myself of this opportunity of expressing the high opinion which I entertain of your pre-eminent scholastic, literary, and medical acquirements.

In all subjects connected with the preservation of the public health, and the prevention of disease, I know you take a deep interest.

A work, therefore, which professes, however humbly, to develop *principles* in connection with these important topics, could not be more appropriately dedicated than to yourself.

That you may long live to enjoy the exalted and well-merited honours conferred upon you (with the unanimous approval of your professional brethren) by our Most Gracious Sovereign, is the

Sincere wish, dear Sir, of your humble
And obedient Servant,
FORBES WINSLOW.

45, *Guildford Street, Russell Square.*
1842.

PREFACE.

All questions connected with the preservation of health have been already so fully and ably discussed, that it requires, on the part of a new candidate for public favour, the exercise of no little ingenuity in order to impart to such investigations the character either of novelty or of interest.

It has not been the object of the Author to lay down for the guidance of the general Reader, any specific instructions for the treatment of particular affections.

The principles which he has endeavoured to develop in connexion with the subject of health, have a reference to a most important, but much neglected, department of Medicine, *viz.* the prevention of diseases.

In proportion as the public are made acquainted with the causes of Disease, and the general principles of Pathology, will the amount of human suffering be diminished. On this subject, the Author cannot resist the opportunity of referring to some observations to be found in a pamphlet recently published by Sir James Clark, Bart. That able Physician justly remarks, that, " Were the public better informed respecting the causes and progress of diseases, they would know that one half of the diseases with which mankind are afflicted might be prevented by common prudence; and that when diseases make their attack, they might generally be deprived of half their violence by a knowledge of, and attention to, their premonitory signs and first symptoms. This is the only kind of medical knowledge useful to the public. Teach them how they may preserve their health; make them acquainted with the causes of diseases, and the best means of preventing them; and teach them to know the first symptoms of disease, in order that they may apply for medical advice when it is of most avail,—and they will possess all the medical knowledge which they can make good use of. I notice this subject here, because I believe that a sound reform of medical education would tend powerfully to bring about so desirable a state of things. All sound medical knowledge must proceed from the profession in the first instance; and until medical men are instructed in that hitherto most neglected part of medical education, HYGIENE, the public can have no correct views of the means of preserving health, and preventing disease."*

On the subject of Insanity, the Author may speak with confidence, having devoted the greater portion of his professional life to the patient study of this malady in all its varied phases.

With the view of enlarging his knowledge on this important branch of practical Medicine, the Author, independently of the opportunities he has had in his own private practice, has visited with assiduity the Institutions (both public and private) set apart for the treatment of mental diseases.

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[*] Remarks on Medical Reform, in a Letter to the Right Hon. Sir J. Graham, Bart., by Sir J. Clark, Bart., M.D., F.R.S., &c. &c.

Many of the facts embodied in the chapter referred to are the result of his own observation.

With respect to the treatment of Insanity, complicated with the disposition to commit suicide, the Author's remarks are mainly the result of his own experience. Since the publication of his work on Suicide, he has had frequent opportunities of testing the practical efficacy of the remedies which he has recommended for the cure of this singular mental infirmity. The Reader, therefore, may confidently rely upon the suggestions laid down in this work for the treatment of suicidal mania.

The Author cannot too often impress upon the attention of his readers, the paramount importance of investigating the morbid manifestations of the mind, with the view of preventing, by an early detection of the premonitory symptoms of Insanity, the full development of the disease. He also feels assured, that were institutions established for the reception and treatment of Insanity in its incipient stage, much benefit would accrue to society generally.

The Author hopes that the views which he has propounded on the subject, may have the effect of opening the eyes of his professional brethren to the necessity of having recourse to remedial measures in the first onset of mental derangement.*

45, *Guildford Street, Russell Square.*
1842.

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* Several of the chapters which compose this work were published some time back in the 'Polytechnic Journal.'

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ON THE

PRESERVATION OF HEALTH.

CHAPTER I.

ON COLD.

Cold is but a negation of heat. It is an expression used relatively, in order to express a degree of temperature. It was for some time a matter of dispute whether cold had a positive and independent existence distinct from what we consider its opposite. Natural philosophers appear now generally to concur in the opinion that heat and cold are not the names of things essentially different, but are only degrees of the same property. When a body is heated, expansion takes place, there is an addition of bulk communicated; but as the substance, the temperature of which has been elevated, cools, it contracts,—thus clearly establishing that cold is the absence of caloric, and that it is but a negative quality.

Like heat, cold was supposed to be capable of radiation, and this fact led many to believe that cold was a property *sui generis*. The apparatus used for showing the radiation of heat, consists of two concave mirrors, placed at some distance, but directly opposite each other. If a heated ball, piece of metal, or a canister of boiling water, be placed in the focus of one mirror, and a thermometer at the other, the thermometer will instantly rise several degrees. If burning charcoal be placed in one focus, and a combustible body in the other, the latter will be set on fire, even at the distance of thirty feet. This fact demonstrates the radiation of heat. If, however, instead of placing in the focus a heated body, a piece of ice be substituted in its place, the thermometer placed at the opposite mirror immediately falls; but, as Dr Arnott observes, "The thermometer happens then to be the hotter body in one focus of the mirrors, placed in relation with a colder body, the ice in the other, and consequently, by the law of equal diffusion, it must share its heat with the ice, and will fall. The mirrors in any case have merely the effect, by preventing the spreading and dissipation of the radiant heat from either focus, except towards the other, of making two distant bodies act upon each other, as if they were very near." *

The production of animal heat is one of the essential conditions of life: by its means an equality of temperature in the body is produced in all climates. Were this not the case, the blood of those who inhabit the northern regions would soon become congealed. Animal heat is generally supposed to be developed in the lungs and all the extreme vessels during the combination of the oxygen of the air with the carbon of the venous blood. *Cæteris paribus*, the quantity of heat generated will be in proportion to the integrity with which the respiratory functions are performed, and the size and vigour of the lungs. In this way we account for persons predisposed to consumption, who have imperfectly developed or diseased lungs, complaining of habitual coldness of the surface of the body and the feet. Persons exposed to the influence of intense cold, require enormous quantities of stimulating animal food. If the supply of nutriment be insufficient, the blood becomes impoverished, and the production of animal heat in the lungs is sensibly impaired, and the ability to resist the operation of a low temperature is greatly lessened.

In order to estimate the degrees of heat and cold, various thermometers have been constructed. Those in common use are Reaumur's and Fahrenheit's; the former is considered a standard in France, and the latter an authority in England. According to Fahrenheit, mercury boils at 600°, and freezes at 39°. Reaumur's thermometer is divided into 80 parts, and Fahrenheit's into 180°. In the latter, the freezing point, instead of being *zero*, is called 32°, the maker having counted from the lowest heat which he met in Iceland, or 32° below the freezing of his scale. 9° of Fahrenheit are equal to 5° of the centigrade (a simple thermometer divided into 100 equal parts), and to 4° of Reaumur. To turn the degrees of any one of these thermometers into degrees of any other, we must multiply by 9, and divide by 4 or 5, or the reverse, and by adding or subtracting the 32° of Fahrenheit, we have, as the result, the degree desired. Temperatures below that of freezing mercury are usually measured by alcohol—a liquid which has not yet been frozen.

We have many interesting illustrations of the fact, that although heat is generally considered to expand bodies, cold also has the same effect under certain circumstances. Water, in the act of freezing, has been known to rend rocks and burst very thick shells of metal. A computation of the force of freezing water has been made by the Florentine Academicians, from the bursting of a very strong brass globe, or shell, by freezing water in it; when, from the known thickness and tenacity of the metal, it was found that the expansive power of a spherule of water, only one inch in diameter, was sufficient to overcome a resistance of more than 27,000 pounds, or thirteen tons and a half. Experiments have also been made on bursting thick iron bomb-shells, by freezing water in them, by Mr Edward Williams, of the Royal Artillery, and published in the 'Ed. Phil. Trans.' This fact was brought forward as a powerful argument by those who considered that cold was a positive substance. Since, however, Dr Black's discovery of latent heat, the phenomenon just referred to

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* 'Elements of Physics.'

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* 'Elements of Physics.'

Cold has a marked effect upon the sensibility. In this respect how extraordinary is the difference beween the native of Germany and of the southern provinces of France? Travellers assert that there are in the neighbourhood of the Poles natives so little endowed with sensibility, that they feel no pain from the deepest wounds.. The inhabitants of the coast of North America, if we may believe the testimony of Dixon and Vancouver, thrust into the soles of their feet sharp nails and pieces of glass, without feeling the slightest uneasiness. On the contrary, the slightest prick from a thorn, for instance, in the foot of the strongest African is frequently followed by convulsions and locked-jaw. The impression of the air is alone sufficient to originate the same disease in the negro children in the colonies, the greater number of whom, according to Richerand, die of locked-jaw a few days after birth. Montesquieu, in alluding to this difference of sensibility in the southern and northern nations, says of the latter, that "if you would tickle, you must flay them."

This philosopher has borrowed from the father of physic one of his most brilliant and paradoxical opinions. In his conception, warm climates are the seat of despotism, and the cold the seat of liberty. This error is completely refuted in the profound and philosophical work of Volney on Egypt and Syria. He shows that what Montesquieu has said of cold climates, applies to mountainous regions, while a champaign is more favourable to the establishment of tyranny. Hippocrates has said of the Asiatics, that their being less warlike than the Europeans depended on the difference of climate, and likewise on the despotic form of government. The author of the 'Seasons' maintains that great crimes are almost always committed in winter. The death of King Charles, the assassination of Paul of Russia, and the martyrdom of Louis of France, all of which occurred in winter, seem to lend to that opinion the appearance of truth; but we must consider those unfortunate events as relating to the origin, course, and successive march of conspiracies and revolutionary times.

Some persons are more susceptible of cold than others. This difference is dependent on a constitutional defect in the power of generating animal heat. Captain Ross remarked, during his late expedition, that the power of resisting a low temperature was very different among the members of his crew. It was always easy, he observes, after a little practice, to predict who would suffer from degrees of cold which others would despise. He attributes this to the variable power of the calorific function in different individuals. Admitting the physiological correctness of this view, we can easily believe that one person might sink and perish much more rapidly than another at the same temperature, and that a degree of cold that might prove fatal to one, others would bear with impunity.

Animals inhabiting the arctic regions possess a more elevated temperature than those of the more genial climes, and on this account are able to withstand the intense cold to which they are exposed. During Captain Parry's second voyage, he carefully examined the temperature of a number of animals immediately after death. He found that the arctic fox and white hare had to maintain a degree of heat 100° higher than the atmosphere in which they lived during the whole of the winter.

Everything that strongly excites the mind, and concentrates the attention or passions towards any particular object, renders the body, to a certain extent, insensible to the influence of cold. The lover braves the rigour of a freezing night with impunity, in order to enjoy a sight of the idol of his affections. The fashionable lady, desirous of pleasing, exposes herself, thinly attired, to intense cold, without being conscious of any unpleasant sensations. The hunter forgets everything in the enjoyment of the chase; we see him exposed to the freezing north-east wind in the depth of the coldest winter, plunging into icy marshes, traversing the valley cold and wet, penetrating the woods, without complaining of the temperature.

> "Manet sub Jove frigido
> Venator, teneræ conjugis immemor."—Hor.

The astronomer, intent on the object of his sublime science, neither feels or is injured by the damps or chilliness of the night. In certain states of excitement of the brain and nerves, cold is resisted in an extraordinary degree. Dr Currie says—"I have seen a young woman, one of the greatest delicacy of frame, struck with madness, lie all night on a cold floor, with hardly the covering that decency requires, when the water was frozen on the table by her, and the milk that she was fed on was a mass of ice."

It was, at one time, believed that in all cases of insanity the sensibility was destroyed, or greatly impaired; but that notion is now considered to be fallacious. In some cases the patient's mind is so absorbed in his morbid delusion, that he does not appear susceptible of the influence of ordinary stimuli; but this is not a very common occurrence.

It has clearly been established, that the absolute degree of cold that can be borne with impunity will depend, *cæteris paribus,* upon the integrity of the functions of the nervous system in generating animal heat. Everything that deteriorates the action of the nervous system, renders the body susceptible to the morbid influences of cold. Persons who are labouring under the effects of poisons or spirits, producing an exhaustion of nervous energy, are easily killed by intense cold. The majority of those who perished in consequence of being exposed to the cold, during the disastrous retreat of the French army from Moscow, were under the influence of intoxication. Exhaustion from hunger and fatigue also predisposes the body to the action of the cold. On this account the poor suffer acutely during the inclement seasons.*

That we possess the power of evolving heat in greater quantity than the surrounding cold media abstract it, is evident. Even in this country the heat of the body remains at its natural degree of 98° during an exposure to an atmosphere, of 10°, 18°, and 20°, or more, below the freezing point. In Russia, Mr Tooke* observes—"That the drivers and their horses, during extreme cold, feel little or no inconvenience in pursuing their employment along the roads, though the beards of the former, and the muzzles of the latter, are covered with hoar frost and little icicles from the congelation; and they travel all day in the severest cold of that northern climate without receiving any detriment. 'Nay, even from 20° to 24°' (below the zero or freezing point) of Reaumur, women will stand rinsing the linen through holes in the ice, four, five, or six hours together, often bare-footed, with their hands dipping in the water all the while, and their draggled petticoats stiff with ice."

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* "All the soldiers that got drunk on the retreat from Moscow, fell asleep at length; the cold and narcotic effect of the alcohol overpowered them with lethargic sleep. At a fête given under Potemkin's administration, at St Petersburgh, by a farmer general of distilled spirits, fifteen to eighteen hundred persons, who committed too great excesses in spirituous drink, perished miserably from cold in the squares and streets of that capital."—*Le Beaupré, M.D.*

Cold, which at 9° or 12° is to an Englishman sharp and rigorous, would be to a Dane or Russian very moderate. At St Petersburgh they consider the temperature ordinary and agreeable as long as the thermometer marks but two, nine, or thirteen below zero. Habit, to a certain extent, modifies the sensibility. The inhabitants of hot climates, transported to the north, become gradually acclimated, and vice versa. Infants in the north play on the snow and ice; they are accustomed at all times to pass from one temperature to another. Men and women expose themselves frequently day and night, with breasts and arms uncovered, in a cold of 2, 13, or 26 degrees below 0°, without being sensible of the cold. The Russian, elated as well by his Spartan education as rigid climate, travels both night and day in the most intense cold, without suffering any ill effects, and the peasant is often seen wrapt up in his pelisse sleeping calmly on the snow. The Norwegian works half naked in a freezing atmosphere.

Cold has a sedative influence on the system. The most interesting illustration of this fact on record is contained in the account of Messrs Banks and Solander's journal.

The Ship *Endeavour* being on the coast of Terra del Fuego on the 21st of December, 1769, Messrs Banks, Solander, and others, were desirous of making a botanical excursion upon the hills on the coast, which did not appear to be far distant. The party, consisting of eleven persons, were overtaken by night on the hills during extreme cold. Dr Solander, who had crossed the mountains which divide Sweden from Norway, knowing the almost irresistible desire for sleep produced by exposure to great cold, more especially when united with fatigue, enjoined his companions to keep moving, whatever pains it might cost them, and whatever might be the relief promised by an indulgence in rest. "Whoever sits down," said he, "will sleep, and whoever sleeps will wake no more." Thus admonished, they set forward, but whilst still upon the bare rocks, and before they had got among the bushes, the cold suddenly became so severe as to produce the effects that had been dreaded. Dr Solander himself was the first who found the desire to sleep irresistible, and insisted on being suffered to lie down. Sir Joseph Banks entreated and remonstrated in vain. Dr Solander lay upon the ground, which was covered with snow, and it was with the greatest difficulty that he was kept from sleeping. Richmond, one of the black servants, suffered extremely from the severe cold, and had a strong inclination to sleep. Sir J. Banks sent five of the company forward to get a fire ready at the first convenient place they came to; and himself, with four others, remained with the doctor and Richmond, whom, partly by persuasion and partly by force, they carried forward; but when they had got through the birch and swamp, they both declared they could go no further. Sir Joseph had again recourse to entreaty and expostulation, but without effect. When Richmond was told that if he did not go on, he would in a short time be frozen to death, he replied that he desired nothing but to lie down and die. Dr Solander was not so obstinate, but expressed a wish to go on, if they would first allow him to take some sleep, although he had before observed, that to sleep was to perish. Sir Joseph Banks and the rest of the party found it impossible to carry them, and they were consequently suffered to sit down, being partly supported by the bushes, and in a few minutes they fell into a profound sleep. Soon after, some of the people, who had been sent forward, returned with the welcome intelligence that a fire had been kindled about a quarter of a mile farther on the way. An attempt was made, which happily succeeded, to rouse Dr Solander, and although he had not slept five minutes, he had almost lost the use of his limbs, and the soft parts were so shrunk that his shoes fell from his feet. He consented to go forward with such assistance as could be given him, but no attempts to relieve Richmond were successful; he, with another black left with him, died. Several others began to lose their sensibility, having been exposed to the cold near an hour and a half, but the fire recovered them.

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* Tooke's 'View of the Russian Empire.'

The celebrated traveller, Dr Edward Daniel Clarke, the late eloquent Professor of Mineralogy in the University of Cambridge, was, on one occasion, near losing his life by cold. Having performed divine service at a church near Cambridge in the afternoon of a very severe, cold, snowy Sunday, in the year 1818 or 1819, he mounted his horse for the purpose of returning home. Soon finding himself becoming very cold and sleepy, and knowing well the danger of giving way to sleep, he put the horse into a fast trot, hoping by that means to arouse himself from the alarming torpor which was coming over him: this means was unavailing; and then fearing that he should fall from his seat, he dismounted, and determining to make every effort to resist sleep, put the bridle under his arm and walked as rapidly as he could. This, however, did not long succeed; the bridle dropt from his arm, his legs began to falter, and he was just sinking down upon the snow, to rise no more, when a gentleman, who knew him, came up to him in a gig, and rescued him from his perilous situation.

Drowsiness does not always follow exposure to great cold. Dr Currie gives an interesting account of the shipwreck of an American vessel on the coast of Ireland, by which the greater part of the crew, fourteen in all, were left for twenty-three hours in a great measure under water, the temperature of which did not exceed 33° or 34° of Fahr., and he states expressly that none of these men were drowsy, and that in no one of the three that perished was death preceded by sleep.

The most frightful picture of the dreadful effects of cold recorded is that drawn by M. Beaupré, in his sketch of Buonaparte's memorable Russian campaign. The reader will have a notion of the dreadful mortality which prevailed, when we state that in June, 1812,* Napoleon entered Russia with an army 400,000 strong, and in the middle of December only 30,000 men repassed the Niemen! This tremendous sacrifice of human life was not altogether to be attributed to the effects of cold; the army encountered many other severe privations. The health of the soldiers was affected by the fatigues of the march, atmospherical variations, and by the excessive heat by day (at the commencement of the campaign), and sharp coolness by night. The water which they drank, and with which they prepared their food, was often drawn from swamps, marshes, or rivulets at the bottom of ravines, where were putrifying carcases of men and horses; independently of this, there was a scarcity of provisions and clothing, and the army suffered from great mental depression; but the principal cause of mortality was the intense cold to which the soldiers were exposed during the winter months. The order for retreat from the ruins of Moscow was given on the 15th of October, and it was not until then that the cold became truly sensible. It was the intention of Buonaparte to establish his winter quarters at Smolensko. The army was but three days' march from this city, when the heavens became black, and the snow began to fall in great flakes; the cold was then felt with extreme severity; disbanded regiments were reduced almost to nothing, by loss of men left every moment on the roads or in the bivouacks. Influenced by the flattering and illusory reports circulated by Buonaparte with reference to the abundance of provisions which he said the army would find at Smolensko, the soldiers pushed forward, and travelled without discipline, night and day; ultimately they were obliged to stop, and thousands perished in the woods, ditches, and at the bottom of ravines. "I have seen them," says M. Beaupré, "sad, pale, despairing, without arms or caps, staggering, scarce able to sustain themselves, their heads hanging to the right and left, their extremities contracted, setting their feet on the coals, laying down on hot cinders, or falling into the fire, which they sought mechanically, as if by instinct. Along the road were seen, in the ditches and fields, human carcases heaped up and laying at random in fives, tens, fifteens, and twenties, of such as had perished during the night, which was always more murderous than the day."

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* The winter of 1812 is regarded in Russia as one of the most rigorous on record; it was intensely felt even in the most southern parts of Russia. The great and little bustard, which during the winter season quit the plain and come annually for protection from the cold into the southern part of that peninsula, towards the coasts, remained benumbed on the snow, and great quantities of them were caught.

Dr Le Beaupré has detailed the circumstances to which he owes the preservation of his life. During the frightful night that the army left Smolensko, he felt much harassed; towards five o'clock in the morning, he was compelled to stop to rest. He observes, "I sat down on the trunk of a birch, beside eight frozen corpses, and soon experienced an inclination to sleep, to which I yielded the more willingly, as it then seemed delicious. I was fortunately dragged out of that incipient somnolency, which would infallibly have brought on torpor, by the cries and oaths of two soldiers opposite, who were striking violently a poor exhausted horse that had fallen down. I emerged from that state with a sort of shock. The sight of what was beside me recalled strongly to my mind the danger to which I exposed myself. I took a little brandy, and set to running to remove the numbness from my legs, whose coldness and insensibility were such as if they had been immersed in an ice bath."

Cold, when very intense, is known to act on the frame so briskly as to depress and destroy vitality with astonishing rapidity. Beaupré states, that he saw soldiers expiring instantaneously from excessive cold, as if thunderstruck. At Smolensko the temperature was so rigorous, that more than thirty grenadiers of the Italian guard fell frozen as they attempted to set themselves in line on the heights beyond Borysthenes. A battalion of the regiment to which Beaupré belonged, when encamped on the same height, lost in this manner many men in a single day.

In Chili there prevails, during certain seasons of the year, a wind so impetuous and cold, that men and animals exposed to its influence are, as it were, petrified. In this way, by acting on the nervous system and destroying the irritability of the heart, cold may often produce sudden death. A higher degree of cold can be borne when the atmosphere is at rest. The reason of this must be obvious. "With the thermometer," says Captain Parry, "at 87° below the freezing point (a fearful degree of cold), and no wind stirring, the hands may remain uncovered for ten minutes or a quarter of an hour without inconvenience, while with a fresh breeze, and the thermometer nearly as high as zero, few people can keep themselves exposed so long without considerable pain." Animal substances are often preserved by extreme and continued cold from decomposition. Bomare affirms, that there are still found in South America a considerable number of the first conquerors of the new world, who, at the commencement of the sixteenth century, preferred, to a long and circuitous route, the short but dangerous passage of the mountains of Peru, in order to examine the rich mines which had been described to them. The warmth of their avarice, and their ardour in the search of gold, could not defend them from the influence of cold, from which they perished, and by which they are still preserved, with all that they carried with them, and in the various attitudes in which they were frozen and surprised by death, constituting a sort of natural mummies.*

Bartholin observes, that the Danish sailors had informed him, that frozen bodies had been preserved in Spitzbergen for a period of 30 years.†

Fish and other cold-blooded animals will survive an intense torpidity. "The fish froze," says Captain Franklin, "as fast as they were taken out of the nets, and in a short time became a solid mass of ice, and by a blow or two of the hatchet were easily split open, when the intestines might be removed in one lump. If in this completely frozen state they were thawed before the fire, they recovered their animation." Captain Franklin has seen a carp recover so far as to leap about with great vigour, after it had been frozen for 36 hours.‡

Isaak Walton quotes Gesner for the fact of some large breams being put into a pond, which was frozen the next winter into one mass of ice, so that not one could be found. In the spring they were all swimming about again when the pond thawed. "A thing almost as incredible," says the sentimental sinner, as Lord Byron calls him, "as the resurrection of an atheist."

M. Prunelle has sent marmots stupified, from Savoy to Paris, packed up like minerals, and has afterwards brought them to life by the application of stimuli.||

In Russia, fish stiff as sticks by cold, have been transported in this condition to great distances. After plunging them in cold water life has been restored. Eels motionless and frozen, but not therefore lifeless, are often brought to the Russian markets. In the north, many persons have been found asphyxiated, and apparently dead for many days, who have been restored to life. Beaupré observes, "How many resurrections might have been made on the retreat from Moscow!"

Barnard Valentin mentions having seen a cat, which, being frozen with cold, and trampled on as dead, was buried in a dung-hill, and in two days after life was restored.

In the *Bibliotheca Britannica* a case is recorded of a woman who, having wandered amid the snows, was seized and benumbed with cold.

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* Dict. d' Hist. Nat.

† Gazette de Salut.

‡ Journal to the Polar Sea,—p. 48.

|| Annales du Museum d'Histoire Naturelle.

The unfortunate woman was completely embedded in the snow for eight days and nights, at the end of which time, the end of a coloured handkerchief appearing above the snow, led to her being discovered; she emerged from the gulf, and took food with eagerness. The peculiarity of this case is, that after the first numbness, she found herself very well beneath her snow covering; she felt neither cold nor hunger, but only thirst, which she appeased with morsels of snow.

An interesting account is before the public of the case of Elizabeth Woodcock, who was involved in a snow drift, on Feb. 2, 1799, in her way home from market, where it is supposed she drank too freely of spiritous liquors. The snow accumulated over her to the height of about six feet, a sort of hollow cone being left from her head to the surface, through which she was enabled to breathe. From this situation she was extricated on the 10th of February, having lain eight days in the snow. Her life was preserved; but the greater part of her feet was destroyed. A snow storm has often providentially preserved the lives of many who have been exposed to the action of cold in mountainous districts.* Snow is a bad conductor of heat, and in this way it acts in protecting the roots and seeds, and tender plants, during the severity of winter. When the green blade of wheat and the beautiful snow-drop flower appear in spring rising through the melting snow, they have recently owed an important shelter to their winter mantle. Under deep snow, while the thermometer in the air is far below zero, the temperature of the ground rarely remains below the freezing point. The Laplander, who, during his long winter, lives underground, is glad to have additionally over head a thick covering of snow. Among the hills of the west and north of Britain, during the storms of winter, a house or covering of snow frequently preserves the lives of travellers, and even of whole flocks of sheep, when the keen north wind, catching them unprotected, would soon stretch them lifeless along the earth.†

Owing to the heat generated in the bowels of the earth, the most intense frosts do not penetrate more than a few inches into it. The water in pipes, buried a few feet in the earth, is seldom frozen. Springs never freeze; when the ground is covered for months with snow, and all the ponds and lakes are frozen, the water which issues from the bowels of the earth remains at its source unaffected. Spring-water is always of the same temperature, and in summer it is considered cold and refreshing only because the atmosphere which surrounds it is warmer.

Artificial cold is produced in various ways. Saltpetre, sal-ammoniac, and many other salts, if mixed with water, greatly increase its coldness. An intense cold may be produced by mixing, in a phial, corrosive sublimate and sal-ammoniac finely pulverized, a pound of each, and pouring on the mixture a pint and a half of distilled vinegar, shaking the whole well together. M. Homberg, who first tried this experiment, asserts that this composition became so cold as scarcely to be held in his hand; and that it even froze while he was making the experiment. A much greater degree of cold may be excited by using snow, or rather powdered ice, instead of fluid water. A mixture of common salt and snow will sink the thermometer to 0° ; with potash and pounded ice it will sink to about 8°. Evaporation has great influence in reducing the temperature of bodies, the conversion of water into vapour being necessarily accompanied with the absorption of much caloric. In India, ice is made by placing the water to be frozen in flat unglazed earthen vessels, which are exposed during the night ; they are placed upon the worst conductors that can be procured, such as sugar canes, dried stems of maize, &c. The dryness of the air causes a very considerable evaporation, and the consequent reduction of temperature is such, that a thin film of ice is formed towards the morning, though the temperature of the air may have been all the time above the freezing point. The quantity of ice obtained is greater when the weather is warm and dry than when it is moist, though in the latter case the temperature of the air may have been actually lower.

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* With respect to suspended animation from cold, it is said by J. Chr. Fabricius, that men have sometimes been blocked up in the mountains of Liffland, and have hibernated for months, without injury; and by Gangin, that in some countries man is a regularly hibernating animal, and that there is a people of Muscovy who die every year on the 27th of November, and are not restored to life until the 24th of April following!—' Vide 'Fletcher's Physiology,' vol. ii. p. 149.

† Dr Arnott.

In India, wine is cooled for the table by surrounding the bottle with a composition of salt and nitre.

But the most remarkable experiments, with reference to artificial cold, were made by Mr Walker of Oxford. He poured spirit of nitre on Glauber's salts, and he found the effect to be similar to that of the same spirit poured on ice and snow ; the addition of sal-ammoniac rendered the cold still more intense. The proportions of these ingredients, recommended by Mr Walker, are concentrated nitrous acid, two parts by weight, water one part. Take of this mixture, cooled to the temperature of the atmosphere, eighteen ounces, of Glauber's salt a pound and a half avoirdupois, and of sal-ammoniac twelve ounces. On adding the Glauber's salt to the nitrous acid, the thermometer fell 52°, viz. from 50° to —2 ; and on the addition of the sal-ammoniac, to —9°. Thus Mr Walker was able to freeze quicksilver without ice or snow, when the thermometer stood at 45° ; viz., by putting the ingredients in four different pans, and enclosing them within each other.

It has been maintained that the morbid effects of intense cold are dependent not so much upon the degree of lowness of temperature, or even the degree to which the body is actually cooled, as on the rapidity of the change, and on the intensity of the sensation excited. Chossat found that the temperature to which animals killed by cold had been reduced before they died, was considerably various, and always higher as the reduction of temperature had been more rapid, and therefore more injurious.

It is a question with physiologists whether the brain or circulation is first affected by extreme cold. That stupor and delirium often result from exposure to a low temperature there cannot be a doubt ; but these effects are, perhaps, owing to the sedative influence of the cold on the capillary circulation, and the blood being driven from the surface of the body to the internal organs and large vessels. But even in those cases where the brain appears to be more especially implicated, the action of the heart is enfeebled and the circulation depressed.

Sir Benjamin Brodie classifies the effects of cold in the following order:—

1. It lessens the irritability, and impairs the functions of the whole nervous system.
2. It impairs the contractile power of the muscles.
3. It causes contraction of the capillaries, and thus lessens the circulation, and stops the cutaneous secretion.
4. It probably destroys the principle of vitality in every part, and does not exclusively disturb the functions of any particular organs.

It may be urged in objection to the last proposition that many circumstances concur in inducing us to believe that the brain is the organ that appears principally to be affected in the chain of morbid causation. In many cases, before torpor has been induced, the intellect has been so confused that the individual is to all appearances in a state of intoxication. Captain Parry, in his journal, relates the case of a man who was exposed for nearly a whole night to the influence of extreme cold. When he was brought on board the vessel and spoken to he looked wild, spoke thick and indistinctly, and it was impossible to obtain from him a rational answer to any question that was put to him. He had every symptom of a man who had been drinking too freely. On this subject Captain Parry observes, "To those who have been much accustomed to cold countries this effect will not appear singular, but I cannot help remarking that many a man may have been punished for intoxication, who was only suffering from the benumbing effects of frost; for I have more than once seen our people in a state so exactly resembling intoxication, that I certainly should have charged them with that offence, had I not been quite sure that no possible means was afforded them on Melville Island to procure anything stronger than snow-water."

The mortality among the old, infirm, infants and children, is very great during the cold winter seasons. It has been affirmed that more than one half of the deaths, and two thirds of the diseases, that occur among the children of the poor, are more or less caused by exposure to a low temperature. How few there are who have a just conception of the intense sufferings of the poor during the inclement season of the year! In this "wilderness of brick and mortar," how many are doomed to perish from the want of means to protect them from the morbid effects of cold. Independently of their insufficient clothing and want of fuel, the poor are peculiarly rendered susceptible of the action of cold, in consequence of their being deprived of proper nourishment. The man who lives well and fares sumptuously every day, can bear for a long period with impunity the influence of severe cold, because animal heat is generated in large quantities; but the poor man has a three-fold evil to contend with, viz. want of clothing, fire, and food.

Many facts combine to show us the utility of animal diet in protecting us from the agency of cold. In countries near the poles, nature has provided such articles of food best calculated to nourish, stimulate, and impart vitality to the frame, and thus enable it to bear up against the rigour of the seasons and the injurious influence of the climate. Dr Aiken states that the Russians, who winter in Nova Zembla, imitate the Samoiedes, and eat raw flesh and drink the blood of the reindeer, in order to preserve their health in these arctic regions. The Greenlander devours, with apparent relish, the raw flesh of the whale, or the half-frozen and putrid flesh of seals, and drinks the blood of these latter animals, or regales on dry fish and whale oil.

In cold climates the appetite is vigorous, and animal food is indispensable; in hot climates, and during the summer in temperate regions, the desire for food is not so urgent, and a light vegetable diet is preferred.

Warm-blooded animals are continually eating; birds, whose temperature is the highest, are doing so incessantly, if they can obtain food. Cold-blooded animals eat little, or seldom.

The inhabitants of cold countries never travel without covering themselves with furs from head to foot. If seized with cold, they rub the benumbed part with snow before entering their houses; they never travel without tea, coffee, some spirituous liquors, and even food, in order to avoid suffering from hunger, which they consider very dangerous.

Beaupré observes, that commanders of divisions should not order halts in winter; they should take care that the men do not lag behind on the march; above all are required gaiety, courage, and presence of mind; these are the surest means of escaping the danger. He that has the misfortune to be alone inevitably perishes. It is not enough to excite those whom cold has seized, and begun to stupify, by voice and gesture; we must not hesitate to use even menaces, and to recur to violent measures, to prevent them from stopping and giving themselves up to perfidious sleep. In Siberia, the Russian soldiers, in order to preserve themselves from the cold, cover their noses and ears with greasy paper. Fatty matters seem to have the power of protecting from cold, or, at least, of greatly diminishing its action. The part of the body which, after being rubbed, has been covered with oiled paper, generally retains heat better. The Laplander and the Samoiede anoints his skin with rancid fish oil, and thus exposes himself in the mountains to a temperature of 36° or 58°. Xenophon, in the retreat of the 10,000, ordered all his soldiers to grease those parts that were exposed to the air. A mixture of turpentine and tallow, one part to four, is suitable for this purpose. It would be proper to rub with it the nose, ears, chin, cheeks, hands, and feet, as well as the articulations of the limbs. If this remedy could have been employed in the retreat from Moscow, Beaupré considers that it would probably have prevented more than one accident. It is a fallacy to suppose that vinous and spirituous liquors preserve the body from the ill effects of cold. In moderate quantities stimulating cordials may be of service, but when exposed to intense and prolonged cold, they are injurious, by causing internal fluxion and exhaustion.

"I am of opinion," says Baron Larry, "that unless the persons submitted for a very long time to the influence of cold, should remain in a perfect state of inaction until asphyxia took place, or unless a second sedative or narcotic cause should act in concert with the cold interiorly, such as drunkenness, partial or general death cannot take place during the continuance of extreme cold. In fact, we have seen travellers cross the Alps and Pyrennees during the most intense cold, without meeting with any accident, whenever the temperature experienced no change. I have had an opportunity of ascertaining the truth of this myself. The Poles choose the most constant period of the frost to undertake, with their sledges, the long and arduous journeys into Siberia: these voyages are dreaded whenever the temperature becomes more or less changeable, because it is then, as they assured me, that they have most to fear the effects of congelation. In my voyage to North America, a number of shipwrecked men, whom we took off the island of Belleisle, near Newfoundland, in 1788, had passed several days in this island, lying upon the snow, during the most severe frost, without meeting with any accident. The evening before our appearance, at a period in which the temperature had changed, two of these unfortunate men perished altogether, and the feet of several others were affected with gangrene."

Dr Trail, of Liverpool, instituted some experiments, with the view of ascertaining whether the sudden application of cold, when the body was highly excited by heat, was as injurious as is represented. On one occasion Dr Trail observed the temperature of his room, and noticed the effect of the heated vapour on the circulation of himself and two others who bathed with him. The temperature of the bath ranged from 133° to 135° of Fahr. The pulse was quickened, but the degree of acceleration varied in different individuals according to their excitability whilst exposed to the great heat mentioned; a powerful effusion of cold water was made upon the naked bodies of the bathers from a shower bath in the ceiling, and this is said to have been remarkably grateful. "It is, indeed," says Dr Trail, "scarcely possible to describe the effect, which is highly exhilarating and refreshing." Acerbi mentions that some of the harness of his carriage having given way in the neighbourhood of one of the Finnish baths, the bathers ran out, although the ground was covered with snow, and, after having afforded the necessary assistance, returned to their luxurious enjoyment.

Many facts, however, establish that death often takes place suddenly in consequence of drinking cold water when the body is heated.

In confirmation of the facts on this subject brought forward by Drs Rush and Currie, I may refer to the testimony of several ancient historians who have incidentally recorded examples of sudden death from drinking cold water.

In Quintus Curtius,* an account is given of the march of the army of Alexander the Great in pursuit of Bessus, through the country of Sogdiani, which is represented as destitute of water, sterile, and covered with scorching sands. The intolerable heat, fatigue, and thirst of the soldiers in their march through this burning desert, are described with all the florid eloquence of the historian. At length, fainting under their toils, they reached the banks of the river Oxus, where, by indulging in large draughts of the stream, Alexander lost a greater number of his troops than in any of his battles. "Sed qui intemperantius hauserant, intercluso spiritu extincti sunt; multoque major horum numerus fuit, quam ullo amiserat prælio."†

A similar story is related by Appian, and a disaster of the same kind is said to have occurred to the Christian army in the holy wars.‡

It is generally supposed that all sudden vicissitudes from heat to cold are injurious, by suppressing the perspiration; but in opposition to this popular opinion, the fact that great and rapid transitions, as from vapour baths to rolling in the snow, are constantly made in some countries with impunity, and even with advantage to the health, is brought forward. The Roman youth, in the heat of their exercise in the Campus Martius, frequently plunged into the Tiber, not only with impunity, but deriving from it a high enjoyment. The Russians remain in baths heated from 106½° to 116° of Fahr., and then, after rolling naked in the snow, return to the bath. Dr Fordyce and Sir Charles Blagden, in their experiments on this subject, passed from a room, heated to upwards of 200°, naked, to the cold air, without being injured in the slightest degree by the sudden change of temperature.

It was reserved for Dr Currie to dispel the popular fallacy on this subject. His views are rational, philosophical, and practical. The general truth connected with all sudden transitions from a high to a low temperature appears to be, that from whatever cause the heat of the body is increased, in proportion to this increase (provided no local disease has occurred, and the body is not already in a state in which it is rapidly parting with its heat), is the safety with which cold may be applied. The numerous apparent exceptions, upon which the popular opinion is grounded, will be found not to invalidate the principle of the circumstances be minutely examined; for it will then be ascertained that the injuries which persons have suffered from the application of cold under the circumstances in question, did not arise from its agency on them *when*

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* Lib. vii, cap. v.

† De Bellis Civil. lib. v.

‡ Gulielm. Tyrius, lib. iii, cap. 16.

hot, but *when cooling, after having been heated;* when a profuse general perspiration was rapidly carrying off the heat, or when fatigue had exhausted the vigour of the system, and the power of cooling heat; and that, on the contrary, where the sensation of heat was great and steady, the heat itself retained, or kept up by exertion, and the living power not debilitated by fatigue, the application of cold was safe and salutary.

It must be evident, from the previous statement, that cold may safely be applied to the body when heated, provided the temperature be kept up by exertion, and while the power of generating animal heat remains in the constitution. The popular practice of waiting till a degree of coolness has taken place before quitting a hot room, or before going into a cold bath, is dangerous in the extreme. It is questionable whether any person ever received an injury from cold, after leaving a heated assembly, if he left while he continued warm, and either by exercise in the air, or by a warm covering, kept up that warmth in some degree until he arrived at home. On the same principle, delicate and infirm persons, before going into a cold bath, are recommended to use such a degree of exercise before immersion as may produce some increase of heat, and thus secure a degree of reaction under the shock. Dr Currie observes that those who, being heated and beginning to perspire, wait on the edge of the bath or water-side until they are perfectly cooled, as hundreds are in the habit of doing, and then plunge in, often feel a sudden chillness and shivering of an alarming and dangerous character.

In cases where injurious consequences follow the introduction of cold liquids into the stomach when the body is heated, the remedies are warm diluents, with ammonia, camphor, opium, cordial diaphoretics, friction of the limbs and surface generally with stimulating embrocations, hot fomentations, sinapisms, and cataplasms of Cayenne pepper to the epigastrium, and especially animal warmth applied to the surface, &c.

Sudden exposure from cold to heat cannot be borne with impunity. In many cases the most disastrous results follow the exposure of frozen parts to the influence of heat. " Woe to the man," says Baron Larry, in his description of Bonaparte's Russian campaign, " benumbed with cold, whose animal functions were nearly annihilated, and whose external sensibility especially was extinct, if he suddenly entered too warm a chamber, or approached too close to the large fires of the bivouac. The more prominent parts, benumbed and frozen, and at a distance from the centre of circulation, were struck with gangrene, which supervened on the instant, and developed itself with such rapidity, that its progress was sensible to the eye, or the individual was instantly suffocated by a kind of turgescence. Individuals were often seen to fall stiff dead into the fires of the bivouac; and every one who approached near enough to heat his frozen limbs, was struck with gangrene wherever the cold had destroyed the vital principle."

Such injurious effects are easily prevented. All external warmth should be carefully avoided until the sensibility and circulation have been somewhat restored by friction with substances little, if at all, elevated beyond the temperature of the parts themselves. Snow is the best application that can be made under these circumstances.

Larry considers that the benefits which result from the application of snow in these cases, consist in the pure oxygen it contains, and the caloric developed by the friction being absorbed by the blood contained in the capillary vessels. The circulation is thus restored, and the course of it is kept up by the subsequent application of spiritous and camphorated tonics, by the internal use of cordials gradually administered, dry and hot frictions over the whole surface of the body, and continued moderate exercise. In case of a deficiency of ice and snow in the first instance, Larry recommends the employment of cold red wine or vinegar, or camphorated brandy, made cold by plunging it into the water of a well.

Cold water, impregnated with salt, appears to have a less injurious effect upon the system than fresh water of a low temperature. Salt water is supposed to stimulate the vessels of the skin, and thus to prevent the debilitating action of cold. Persons shipwrecked during the winter have a better chance of surviving by immersing the body for the greater part in the water (for the sea is then warmer than the wind, and there is no evaporation from the skin) than if they were to remain motionless out of the water. Sailors and fishermen are very healthy, and declare that they never catch cold from getting wet with sea-water. Capt. Bligh, in alluding to the stimulating effects of sea-water, says in his narrative, "As I saw no prospect of getting our clothes dried, I recommended every one to strip and wring them through salt water, by which means they received a warmth that, while wet with rain-water, they could not have, and we were less liable to suffer from colds or rheumatic complaints."

Cold is a valuable therapeutical agent. It has remarkably sedative and tonic properties. In some fevers and inflammations it is of essential service in allaying the inordinate action of the vascular system. At one time the application of cold to parts in a state of inflammation was supposed to act beneficially, by diminishing the morbid degree of heat generated; but improved pathological science has established that such is not the case. In local inflammations, cold evaporative lotions are applied with great benefit; and in inflammation of the brain, cold applied to the scalp has a sedative influence on the blood-vessels, and thus lessens the flow of blood to the part affected. Cold has a great effect in controlling febrile action: Hippocrates notices this fact. In all cases of fever, when the temperature of the body is above 98°, when there is no sense of chilliness, and when there is no general or proper perspiration, the free use of cold drink, and the affusion of cold water over the skin, are the most salutary remedies that can be adopted. Cold very often produces great muscular relaxation. In some cases of dislocations, where the muscular contraction is great, and an impediment is thus thrown in the way of the reduction, the patient is often placed in a cold bath, after which the limb is easily restored to its natural situation.

The tonic properties of cold are pointed out when speaking of the effect of cold bathing.

It was at one time supposed that cold water was a specific for the plague. M. Desgenettes, physician to the French army in Egypt, relates that a miner, attacked by the plague during the expedition into Syria, escaped naked, during a violent delirium, from the fort of Calhielh, and wandered nearly three weeks in the desert. Two swellings, which he had upon him at the time, suppurated and healed of themselves: this man perfectly recovered. An artilleryman also escaped from the lazaretto of Boulak on the day he was admitted, and in a paroxysm of a violent delirium precipitated himself into the Nile. He was taken out about half an hour afterwards, and perfectly recovered. On this subject Dr Currie observes, "How fruitless and how perverted are the efforts by which learning and science have attempted to come at this fatal disease! The best remedies for the plague were probably missed by the physicians both of France and England; they were not to be traced in the prevailing systems of medicine, or in the pharmacy of our shops; but it is probable they might have been found in the refreshment of the breeze, in the dews of the night, and in the waters of the Nile."

Cold also acts as a stimulant. In certain convulsive diseases, accompanied by great torpor, the affusion of cold water on the naked body will often rouse the dormant sensibility. Cold affusion is also of essential service in cases of asphyxia brought on by the fumes of charcoal. Dogs suffocated in the vapours of the *Grotto del Cano* are recovered by plunging them in the adjoining lakes. In cases of poisoning by opium and prussic acid, cold affusion is a most valuable remedy.

The climate of a country is mainly dependent on its temperature. The mildness of the European climate, contrasted with that of Asia and America, is very marked; this circumstance is said to arise from the general prevalence of westerly winds, which are elevated in temperature in consequence of passing over a mass of water, which even in the month of January, under the mean parallels of 45 or 50 degrees, does not fall below 48° and 52° of Fahr. The northern boundaries of Asia and America extend to the winter limit of the polar ice. Unobstructed by any chain of mountains, the north winds blow with unmitigated fury over icy plains, extending northward to the pole, and eastward to the point of maximum cold, which, according to Humboldt and others, is situated near the meridian of Behring's Straits. The refrigerating effects of these winds, says Dr Copeland, are not counterbalanced by burning deserts on the southern side of these continents; or, as respects Asia, by any great extent of land flood below the equator; consequently the Asiatic countries situate in the temperate zone, more especially, are not warmed by ascending currents of heated air, such as those which arise from the deserts of Africa, and are so beneficial to Europe. The position of the great mountain chains of Asia, and the elevation of the country, also contribute to diminish the temperature, they presenting a barrier to the warm winds from the equatorial regions. Elevated places and groups of lofty mountains accumulate, and preserve the snow till late in the summer, and give rise to descending currents of air, which cool the circumjacent countries. Asia, moreover, in the whole extent of Europe, has no sea on its western side; consequently the west, or predominating winds, are, for the greater part of this quarter, land winds, and their severity is increased by the great enlargement of the land towards the north. These circumstances occasion remarkable differences in the climates of Asia and the western countries of Europe.

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CHAPTER II.

THE PHYSIOLOGY OF DEATH.[*]

> ——— " A gaunt form, pale
> But regal, swathed in robes of lustrous white
> That took no shadow in their folds; his brow
> Was circled with a silver coronet,
> Which had a ghastly radiance, and was set
> With rims of stars, orb-sockets, blank and rayless."
> (*From an unpublished Tragedy, by I. Westland Marston, Esq.*)

> " Nihil est in morte quod metuamus, si nihil timendum vita commisit."

The love of life is one of our strongest instincts. We are accustomed to look upon death with a superstitious horror, and to attach to the last inevitable moment the most gloomy and terrible associations. It is in vain that we attempt to dismiss from our mind the fact that there is a time appointed for all to die. The most sceptical philosophers have never had the boldness to question the uncertainty of life. A thousand circumstances are constantly reminding us of the frail tenure by which we hold our existence. We have no occasion to visit the sombre chamber of death, to witness the last struggle of expiring nature, or to receive the parting embrace and admonition of a near and dear relative, in order to be made conscious that the grim King of Terrors is no ideal creation of the "heat-oppressed brain." It is unnecessary that we should have daily crossing our path the melancholy funeral procession winding its way through the streets of the metropolis, followed by those paying the last tribute of affection and respect to a departed spirit, to be convinced that this frail tenement which we now inhabit, and which is endowed with life, health, and spirits, must, ere long, crumble into dust. Universal nature has death stamped in legible characters on its every feature. The globe which we inhabit has, ever since its creation, been undergoing a series of organic changes. The splendid palaces and magnificent temples reared by the genius of antiquity, and associated in our minds with the mighty spirits of ancient Greece and Rome, have, with a few exceptions, passed away. The sweet and beautiful flower—fit emblem of death—whose fragrance and loveliness afforded us so much pleasure, buds into life and then expires. The spirit of change, or death, pervades alike the animal, vegetable, and mineral kingdoms. Organic bodies become separated into their constituent elements. These elementary particles unite with other bodies, and new structures are reared. If we looked on death philosophically, it would be disarmed of most of its terrors. What we call destruction, or death, is but a change of elements. Annihilation is a moral and physical impossibility. How presumptuous it is in man to boast of his capability of destroying the productions of the great Creator—nothing that has ever been formed has ceased to exist.*

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[*] It is computed by Dr Casper, that there are on the earth 960.000,000 human beings, and that the average deaths are 29 000,000 annually, 80,000 daily, nearly 3,700 hourly, and 55 every minute. The greater number of deaths occur after midnight, or the first in the morning. In Great Britain, 18,200 die annually; in European Turkey, 33,000; in Greece and Italy, 33,000; in the Low Countries, 26,500; in France, 26,600; in Prussia, Austria, Switzerland, Portugal, Spain, 25,000; in Denmark, Poland, Germany, Flanders, European Russia, 22,000; in Sweden and Norway, 21,300.

There is something so impressive in the thought of death, there is such a weight of misery or bliss depending on it, that one might imagine the bare recollection of it would destroy every other thought, and not only render us insensible to the blandishments of the world, but almost disqualify us for the duties of life. In many minds, however, it fails to excite even an ordinary interest. This apathy may arise from the bulk of mankind being accustomed to confine their views of death exclusively to its aspect on their present condition, and that, by being disassociated from the prospects of another life, it loses all its power either to interest the mind or affect the heart; like other subjects of importance which, though calculated in themselves to awaken and absorb all the powers and passions of the soul, have so frequently been presented to our attention, that we are apt to treat them with an unholy familiarity. To many minds, however, the subject of death possesses great attractions. Its awful sublimity—the mysteries that hang over it—and its natural association with all that is tender and pathetic, invest it with a charm to which it is impossible for the man of feeling and taste to be insensible. What more sublime than the transition of a soul from one state of being to another! What more mysterious than the passage of the disembodied spirit through the valley of death! Who can tell the feelings of the traveller, or the visions of the place?

The love of life is a wise instinctive principle implanted within us. Brutes appear also to be strongly endowed with it. How often do we see persons exhibiting a reluctance to leave this world when they have been deprived of everything calculated to make existence desirable. The man whose days and nights are rendered miserable by some painful disease, still clings tenaciously to life, and looks upon death with dread. The poor hypochondriac, with a mind tortured by imaginary miseries, cannot think of dissolution without a feeling of horror. Dr Reid attended a poor patient at a dispensary, who was dying of asthma caused by water in the chest. The man exhibited during the last agonies of death a strong desire to live; he at last confessed that "he was ashamed of feeling so much attached to this last *rag* of life."

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* "Not all the soaking in the world in the cauldron of Medea, nor sleeping with fair Shunamites, nor drinking potable gold, nor replenishing the veins with young blood, can ever enable man to resist his own inherent cause of decay, till he shall find out the secret of controlling the process of absorption. Till this be done, vain are the hopes of men, as observed by Dr Symonds, after Boerhaave, 'who look for an agerasia.'"—*Dr Fletcher.*

The case of the great moralist and philosopher, Dr Johnson, is familiar to most minds. He had always a great fear of death, even when in the enjoyment of perfect health. It amounted to a superstitious feeling. He says, in one of his letters to Boswell,—"I cannot think without emotion of the removal of any one I know from one state to another." In a letter to Dr Taylor, he exclaims—"O, my friend, the approach of death is very dreadful! I am afraid to think of that which I cannot avoid." He told Dr Hawkins that he never had a moment in which death was not terrible to him. He died eventually of dropsy. In order to prolong his life, he procured a lancet, with which he was going to puncture his legs, which were much swollen. He was, however, prevented from doing so; and when he was entreated not to do so rash an action, he said that he would not. Shortly afterwards his arm was seen to be moving under the bedclothes, and upon turning down the clothes his friends found that he had been plunging a pair of scissors into the calf of each leg.

Hazlitt supposes that the subject of death is made ghastly to our imaginations in consequence of our associating with it the idea of life. We think how we should feel, not how the dead feel.

> "Still from the tomb the voice of nature cries,
> Even in our ashes live their wonted fires."

"The melancholy appearance of a lifeless corpse," says Tucker, "the mansion provided for it to inhabit—dark, close, and solitary—are shocking to the fancy; but it is to the fancy only, not the understanding, for whoever consults this faculty will see at first glance that there is nothing dismal in all these circumstances. If the corpse were kept wrapped up in a warm bed, with a roasting fire in the chamber, it would feel no comfortable warmth therefrom; were stores of tapers lighted as soon as day shuts in, it would see no object to divert it; were it left at large it would have no liberty, nor if surrounded with company would be cheered thereby; neither are the distorted features depressions of pain, uneasiness, or distress. This every one knows, and will readily allow upon being suggested, yet still cannot behold, nor even cast a thought upon these objects without shuddering; for, knowing that a living person must suffer grievously under such appearances, they become habitually formidable to the mind, and strike a mechanical horror which is increased by the customs of the world around us."*

Lord Byron has beautifully illustrated the phantasmal fear of death, which too often haunts the imagination. In one of his dramatic poems, Adam and Eve having been driven out of Paradise, Cain is represented conversing with the evil spirit, Lucifer, on the nature of death. As the passage to which I refer is not only a correct portraiture of what passes through the mind, but full of exquisite touches of poetry, no apology is necessary for giving it at length.

> "LUCIFER. Darest thou to look on death?
> CAIN. He has not yet
> Been seen.
> LUCIFER. But must be undergone.
> CAIN. My father
> Says he is something dreadful; and my mother

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* Light of Nature pursued.

Weeps when he is named; and Abel lifts his eyes
To Heaven, and Lillah casts her's to the earth,
And sighs a prayer, and Adah looks on me
And speaks not.
  Lucifer. And thou?
  Cain. Thoughts unspeakable
Crowd in my heart to burning when I hear
Of this almighty death, who is, it seems,
Inevitable. Could I wrestle with him?
I wrestled with a lion when a boy,
In play, till he ran roaring from my gripe.
  Lucifer. It hath no shape, but will absorb all things
To bear the form of earth-born being.
  Cain. I knew not that, yet thought it, since I heard
Of death; although I know not what it is.
Yet it seems horrible. I have looked out
In the vast desolate night in search of him,
And when I saw gigantic shadows in
The umbrage of the walls of Eden, chequered
By the far-flashing of the cherub's sword,
I watch'd for what I thought his coming, for
With fear rose longing in my heart to know
What 'twas which shook us all—but nothing came;
And then I turned my weary eyes from off
Our native and forbidden paradise,
Up to the lights above us in the azure,
Which are so beautiful. Must they too die?
  Lucifer. Perhaps—but long outlive both thine and thee!
  Cain. I am glad of that. I would not have them die,
They are so lovely."

The intrepid Marshal Biron, on his death-bed, gave way to "womanish tears and raging imbecility;" and the virtuous Erasmus, with miserable groans, was heard, when in the act of dying, to cry out, "Domine, Domine, fac finem."

Many, with the notion that the fear of death is beneficial to the mind, have done their best to keep the idea constantly before them. Young raised an artificial idea of death; he darkened his sepulchral study, and placed a skull on his table by lamp-light. Dr J. Donne, the celebrated English divine and poet, is said to have longed for the hour of dissolution. Previous to his death, he gave instructions for a monument, which his friends contemplate erecting to his memory. A carver made him in wood a figure of an urn, which was brought into the doctor's chamber. Having taken off his clothes, he procured a white sheet, which was put on him, and tied with knots at his hands and feet. In this state he stood on the urn, with his eyes closed, and a portion of the sheet turned aside in order to exhibit his lean, pale, and death-like face. In this posture he was sketched by a painter. This monument was kept constantly by his bedside until the day of his death.

This fear of death acts most injuriously on the mind. If the subject be considered in the spirit of true Christian philosophy, it would not excite such unnatural emotions. "Of the great number to whom it has been my painful professional duty to have administered in the last hours of their lives," says Sir H. Halford, "I have sometimes felt surprised that so few have appeared reluctant to go to 'the undiscovered country from whose bourne no traveller returns.' Many, we may easily suppose, have manifested this willingness to die, from an impatience of suffering, or from that passive indifference which is sometimes the result of debility and extreme bodily exhaustion. But I have seen those who have arrived at a fearless contemplation of the future, from faith in the doctrines which our holy religion teaches; such men were not only calm and collected, but even cheerful in the hour of death; and I never quitted such a sick chamber without a wish that my last end might be like theirs."

Some, indeed, have clung to life anxiously—painfully; but they were not influenced so much by the love of life for its own sake, as by the distressing prospect of leaving children dependent upon them to the mercy of the world, deprived of their paternal care, in the pathetic language of Andromache,

Νῦν δ'ἄν πολλά πάθησι, φίλου ἀπὸ Πατρὸς ἁμαρτῶν,

"These, indeed, have sometimes wrung my heart."

The very dread of death often produces it. If the mental and physical energies are prostrated by an acute disease, and the patient allows his imagination to be haunted by the dread of dissolution, his chance of recovery will be considerably lessened. Everything should be done by the physician to rouse the mind from its state of torpor, and to encourage hope. In cases of serious organic disease, where death is inevitable, it is the duty of the medical attendant to represent to the patient the true state of his case. Under these circumstances concealment would be a crime. In order to give a proper conception of the nature or phenomena of death, it is necessary that we should be acquainted with those conditions on which life is dependent. Medical philosophers have in vain endeavoured to discover the seat of the vital principle. The brain, heart, and lungs have, at respective periods, been considered to be the local habitation of that by which we live, move, and have our being. This exclusive attention to particular organs has prevented us from observing the sympathetic action which exists between all the important organic functions. Life is said to consist in an assemblage of all the functions. The brain has been seriously disorganized without affecting the vital principle; the heart has been wounded without causing death, and individuals have been known to live for many years with extensive structural disease of the lungs.

It is the harmonious action of the three organs that constitutes life, and whenever this is interrupted for any length of time, death ensues. The brain secretes the nervous energy which is diffused through the body, and without which no organ could perform its functions. The heart propels the blood to the brain, lungs, and rest of the body; and in the lungs the blood undergoes an important chemical change; viz., from venous, or dark, to arterial or scarlet blood. If respiration be suspended, and air is not admitted into the lungs, venous blood is sent to the brain, and the functions of that organ become immediately paralysed. In this way persons die who are drowned or strangled. It was at one time supposed, that in hanging death was caused by apoplexy being induced. This is not a fact. In consequence of the pressure of the cord on the windpipe no air can obtain access to the lungs, and the blood ceases to be arterialized, and being sent in an unchanged state to the brain, it acts as a poison on that organ. Many experiments have clearly shown that the above is the correct physiological application of death from hanging. Animals, previously to being suspended, have had an opening made in the trachea below the situation of the cord. Into this opening a small silver tube has been introduced, through which air is received into the lungs. Under these circumstances dogs have been hanged by the neck for a considerable period, without being killed. During the last century a man of the name of Gordon, a rich butcher, was sentenced to be hanged. He bribed a surgeon to make an opening in the trachea, through which a small tube was passed. The man hanged the usual time, and when removed by his friends he was found to be alive. He did not, however, completely recover. In cases of asphyxia death results in the same way; the functions of respiration being suspended. A blow on the head may suddenly extinguish life, by stopping the action of the respiratory apparatus, as well as the action of the heart. If the heart ceases to contract, the blood is not transmitted through the lungs, and if the lungs be incapable of performing the proper duties, venous blood is sent to the coronary vessels on the surface of the heart, and that organ ceases to be stimulated, and syncope and death ensue. The brain, heart, and lungs have been aptly described as the "tripod of life," and the phenomena of dying must, of course, be greatly dependent on the condition of one of the three organs. Death may commence in the brain, heart, or lungs.

Life is divided into two conditions, viz., organic and animal; by means of the former its existence is maintained by a due performance of the functions of respiration, digestion, absorption, circulation, and secretion. By means of the organic life, we transform into its proper substance the particles of other bodies, and afterwards reject them when they become heterogeneous. The animal life connects man with the external world, and consists of sensation, motion, speech. One is an interior and the other an exterior existence. Vegetables are supposed to be endowed only with organic life; animals exclusively possess animal life. Bichat compares the two lives to two lights which burn at the same time, and which have only a determined quantity of material for aliment. In which case, if one be agitated by a stronger wind than the other, it must necessarily be sooner extinguished.

The most important physiological conclusion connected with this view is the fact, that natural and sudden death terminates the animal life for a considerable period before it extinguishes the organic life.

The man who dies at an advanced age expires in detail. All his external functions gradually decline in vigour. The faculties of his mind are weakened, particularly that of memory, his senses are obscured, and he becomes less susceptible to the influence of various stimuli. Every change tends to lessen those ties which connect him to surrounding objects, and in this way are advantageous to him in alleviating the regret with which he would otherwise contemplate the hour when these bonds are to be finally severed.

So happily are we constituted by a wise Creator, that each of the ties which connects us to the world is severed very gradually; our enjoyments leave us at last almost imperceptibly, and often, before our life is terminated by the stroke of death, we have become insensible to its value.

Actual death has been compared to a person falling asleep. The interruption to the functions of respiration is the only apparent source of uneasiness to the dying, and in a ratio to this is the sensibility impaired. As the hour of dissolution approaches, the surface of the body becomes cold; the eyes become less brilliant and assume a hollow appearance. The face becomes pale and pinched. The person lies on his back, and often slips down to the bottom of the bed; his powers of speech become fainter and fainter; his lips are bloodless, and occasionally he mutters in a low delirium, and appears to be catching at imaginary objects in the air. The pulse becomes sensibly affected; the breathing lessens and intermits; every expiration rattles—the circulation diminishes near the heart until a slight tremor or sigh denotes the disunion of soul and body, and thus it is that—

"Like a clock worn out with eating Time
The wheels of weary life at last stand still."*

When the heart has ceased to beat, and death has, to all appearance, taken place, life may not altogether be extinct. The capillary circulation sometimes continues after the action of the heart has stopped. Dr Speranza refers to the case of a young man, who died at the age of twenty, whose face continued warm, and his body covered with drops of sweat, for three hours after death. At the end of twenty-four hours, though the body was livid, the minute vessels on the surface of the skin continued to carry on the functions. The heat of the body has been known to be restored a few hours after death, and then again to subside. The hair and nails have been known to grow after death. In cases where death is the result of a lingering process, vitality may be retained in some parts for a considerable period after dissolution.† An individual who has suffered from compression of the brain, or who has been attacked by apoplexy, still lives internally for several days after he has ceased to exist for external objects. If, on the contrary, death attacks any essential organic function, as the circulation, in cases of wounds or ruptures of the heart, &c., those functions are suddenly terminated, but the animal life ends at the same instant. These observations are of great practical importance. They point out to us the value of those exertions which are made to restore animation in cases of apparent death from hanging, drowning, and suffocation. They teach us that the loss of sensation and voluntary motion, together with a cessation of respiration and of the heart's action, are by no means sure indications of death; that the powers of life still continue to exist under these circumstances, and may again be called into action by the employment of proper means.

The signs of approaching death are numerous; of course they must vary with the cause which produces it. Hippocrates has noticed particularly the alterations which take place in the physiognomy in the act of dying; the nose becomes sharp, the eyes hollow, the temples collapsed, the ears cold and contracted, the skin about the forehead hard, terse, and dry, and the whole face assumes a black, livid, or leaden hue. This is termed in the schools of the present day the *Facies Hippocratica.* Independently of these signs, the dying man catches at imaginary objects in the air; a kind of *ocula spectra* appears to disturb him; he often fancies he hears imaginary voices, tolling of bells, &c. But these signs will be more minutely referred to when I speak of the delirium of the dying. The "picking of the bedclothes," or "fumbling of the sheets," as Dame Quickly terms it, has been noticed from the earliest times. The peculiar cadaverous odour of the corpse has been perceptible for some hours before death. Dr Elliotson states that patients have recovered even after this exhalation has been developed.* The voice becomes shriller than natural; sometimes the action of the heart ceases gradually. This happens when the patient has laboured under a protracted disease. In some cases the heart, before finally ceasing to beat, contracts with great violence, and then suddenly stops. The "death rattle," which is often so distressing to those near the bed of a dying person, is caused by the ejection of air from the lungs through the fluid in the trachea, or wind-pipe. The respiration is often extremely laborious, and this has been termed by Laennec, "the catarrh of the dying." As the blood is not propelled to the extremities, animal heat is not evolved, and the feet become cold, the fingers pinched and livid.

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* "More than a hundred experiments on living animals have satisfied me," says Richrand, "that the intestines are always the last part in which the traces of life may be discovered. Whatever may be the sort of death by which they are destroyed, peristaltic motions are still continued in this canal, while the heart has already ceased to beat, and the rest of the body is all an inanimate mass." Dr Smith observes, "that the corollary from this position is obviously the propriety of applying stimulants to the intestinal tube in cases of suspended animation."

† "I could never see the close of life under these circumstances," says the eloquent Dr Ferriar, "without recollecting those beautiful lines of Spenser:

'Sleep after toil, port after stormy seas,
Ease after war, death after life, doth greatly please.'"

The above are generally the signs of approaching death. The indications of actual death are equally varied. It will be impossible, within the limits of this paper, to enter even upon the confines of those important and interesting points connected with the indications of actual death; it is my purpose merely to enumerate the main signs, and to leave the consideration of the particulars for some future occasion. This subject is important, not only physiologically, but practically, as being connected with the questions of premature interment, trance, &c.

The signs of actual death are generally considered to be, cessation of the heart's action and pulsation, stoppage of respiration, absence of animal heat, rigidity of the muscles, coagulation of the blood, and putrefaction of the body. No one of the above signs can be relied upon if taken by itself; it is only when they are viewed collectively that they are important. In many cases the heart, to all appearance, has ceased to beat, and death has not resulted; the same may be said with reference to the respiration. The ordinary mode of testing the presence of death, by holding a mirror to the mouth, or by light downy bodies being placed near the mouth and nostrils, is very fallacious. An almost total absence of animal heat is often noticed in hysterical affections, tetanus, and cholera, as well as in death. Rigidity of the muscles is not always an indication of death; it generally lasts for twenty or thirty hours, and often for seven or eight days; it commences in the head and trunk, and afterwards in the extremities. This phenomenon is considered to depend upon a lingering vital contraction, and to be the last effort of life; but this position is untenable. It is important to distinguish the rigidity caused by disease and that which follows death. The rigid muscular spasm caused by disease is preceded by the loss of heat; in death the reverse takes place. The contraction of the muscular fibres in death may be overcome by force. In some affections of the head and spine a peculiar rigidity is produced, which may be confounded with the cadaverous rigidity. M. Marc relates the case a gentleman who went to the theatre in apparently good health, and after the representation was over, was found by his friends sitting in the front of his box with his head resting upon his hands, and his elbows on the ledge; he had died of apoplexy, and had been retained in that position by the tonic spasm of the muscles.

In violent deaths the blood remains in a fluid state. Putrefaction is said to be an invariable sign of death. Winslow, the celebrated Danish anatomist, who paid much attention to the uncertain signs of death, in consequence, it is said, of his having been buried alive and then restored to life, pronounces it "unicum signum;" other physicians maintain the contrary.

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* This phenomenon must be the result of incipient putrefaction. Haller maintains that it may commence in a living person; he relates of one Vandenhoeck, his bookseller, that when lying in the last state of malignant fever, he prophesied his approaching death, and that he grounded his prediction on his sense of smell.

In many cases the countenance of the dead assumes an almost heavenly appearance. Although a few minutes previously, when in the act of dying, the muscles of the face have been violently distorted, a very short period after the last struggle the expression has been truly angelic. The immortal poet has unfolded with exquisite effect this phenomenon. In Romeo's lamentation over the fate of Juliet he exclaims—

> "O my love! my wife!
> Death, that hath suck'd the honey of thy breath,
> Hath had no power at all upon thy beauty;
> Thou art not conquered; beauty's ensign yet
> Is crimson in thy lips, and in thy cheeks,
> And death's pale flag is not advanced there."

The 'Bard of Hope,' in alluding to the same placid appearance of the countenance, says—

> "Hush'd were his Gertrude's lips! but still their bland
> And beautiful expression seem'd to melt
> With love that could not die."

It has often been my painful duty, in the discharge of my professional obligations, to witness the last fearful contest between life and death. The sight is often not the most pleasing one to contemplate. At the moment of death the mind occasionally becomes most brilliant in its conceptions. Every faculty appears to be endowed with increased energy. Visions of the past float before the imagination—old associations are revived. The mind appears to revisit the scenes of boyhood. The names of old acquaintances, the companions of youth, rush on the memory, and the dying man is often seen to hold sweet converse with friends and relations long since dead and gone. Occasionally the mind appears to be distressed at the sight of some imaginary object. I once heard a dying person complain of not being able to die. A young man whom I attended some years back, and whose case was hopeless, said to me one day, on visiting him, "Oh, I wish to die, but cannot do so." I asked him the reason of it, and he replied that he could not die, as there were some pigeons' feathers in the bed. I endeavoured to prove to him the absurdity of the notion, but in vain. He remained in a dying state for some days. One afternoon he implored his mother to place him in a chair by the fire, as he wished to die, but never should unless his bed were changed. He was accordingly removed from the bed to the chair. He had not sat down for a minute before he expired. His life was not prolonged, as his friends supposed, by his being in the vicinity of pigeons' feathers. It is well known that towards the termination of many diseases the slightest change in the position of the patient often produces instantaneous death. A person may lie on his back for some days in a dying state, and if the nurse attempted to lift the patient out of bed, or even to raise him in bed, the exertion necessary to accomplish this will often bring about a fatal issue. In the case just referred to the man died in consequence of the sudden exhaustion caused by removing him from his bed to the chair.

The delirium of the dying has a close resemblance to the phenomena of dreaming. Outward objects appear to excite in the mind peculiar trains of thought not necessarily connected with the circumstances which called them into existence.

The visual conceptions reproduced in some minds appear to have been derived from poetical reading. "We remember," says Dr Symonds, "hearing a young man who had been but little conversant with any but civic scenes, discourse most eloquently a short time before his death of 'sylvan glen and bosky dell, purling streams and happy valleys, babbling of green fields,' as if his spirit had been always luxuriating itself in the gardens of Elysium." It not unfrequently happens that the spectres owe their origin to contemplations of future existence; and consequently, that the good man's last hours are cheered with beatific visions, and communion with heavenly visitors.

"Saw ye not even now a blessed troop
Invite me to a banquet, whose bright faces
Cast thousand beams upon me, like the sun?
They promised me eternal happiness
And brought me garlands, Griffith, which I feel
I am not worthy yet to bear; I shall
Assuredly." *King Henry VIII*, Act iv, Sc. 2.

Dr Symonds mentions a curious case of derangement which occurred in a patient with pulmonary consumption. The derangement consisted in a morbid association of ideas by mere similarity of verbal sound, or in other words, a propensity to rhyme. Every person who came to the bedside was sure to receive a distich in honour of his name; nor could any remark be made in his presence without his seizing one of the words uttered, and finding a rhyme for it, in doing which he exhibited great ingenuity.

It is difficult to account, either physiologically or metaphysically, for the prophetic inspiration with which the mind appears often to be endowed a short period before death. In the act of dying, the nervous energy is concentrated to a focus, and on this account the brain, the organ of the mind, acts with unusual vigour. Again, owing to the respiration being imperfectly performed, the blood is not sufficiently changed in the lungs. The blood sent to the brain is of a venous character, and acts on the cerebral mass like opium, and produces that "lightening up of the mind" before death, which was noticed as far back as the time of Aretæus. That celebrated physician of antiquity remarks, that the mind, in the act of disengaging itself from the body, becomes purer and more essential, as if commencing already its spiritual existence. The prophetic power alluded to has been noticed from the most ancient times. Homer represents the dying Patroclus foretelling the fate of Hector, and denouncing no less certainly the fate of Achilles (Iliad, xvi, 852; xxii, 358). Shakspeare makes Hotspur (Hen. IV, Part 1, Act v, Scene 4) say—

"O, I could prophesy
But that the earthly and cold hand of death
Lies on my tongue."

And the dying John of Gaunt is made to exclaim—

"Methinks I am a prophet new inspired,
And thus, expiring, do foretell of him."

It is the commonly received notion that death is attended with considerable pain. It is natural that such a conclusion should be drawn by those who may have witnessed the fearful agonies that are often seen to accompany the last eventful struggle with the King of Terrors. In some diseases the patient dies in violent convulsions; he foams at the mouth, and forcibly extends his legs and arms. The most painful death I ever saw was that of a man who laboured under a severe attack of bronchitis—inflammation of the air-tubes. In this disease the patient is suffocated, and the gasping for breath which takes place at the moment of dying is truly awful to those whose duty it is to witness it. Although the patient may suffer great pain a short period before death, the act of dying cannot, reasoning physiologically, be painful: consciousness is entirely suspended. In cases of epilepsy, the convulsive struggles are often of a most violent character, and yet the patient, when restored to his senses, has no recollection of having felt any pain. On this subject Dr Symonds justly observes, that "the practitioner ought to be able to console the friends of the dying by the assurance that, whatever may have been the previous torture, it must be all over when once these changes begin in which death essentially consists. He must explain to them how, upon the failure of the circulation, the function of the brain must cease by necessity; that if the cessation of the former be gradual, that of the latter may, and often does, precede it; that if the mental process begins in the lungs, unconsciousness precedes the want of the circulation; and if in the brain, that an injury of this organ, sufficient to affect the lungs and the heart fatally, is sure to annihilate its own sensibility. The muscular spasms, the slow, gasping, and gurgling breathing, the collapsed and distorted features, though in some cases accompanied by feeling, are altogether independent of it. Convulsion is not, as superficial observers often interpret it, the sign of pain, or the result of an instinctive effort of nature to get rid of the cause of pain—it is an affection of the motific, not the sensific part of the nervous system. The pangs of disease may last till within a short period of death, but it is a great error to attribute them to the process that brings them to an end. Such cases are rare; it is far more common for the sensibility to be blunted, or for the cause of pain to subside, before the phenomena of dying commence." What the mental sufferings are during the passage through the valley of the shadow of death, who can tell? I cannot, believing in the immortality of the soul, and a future state of rewards and punishment, suppose that the mind is in a quiescent condition during that awful crisis. Its feelings must be modified by the character and peculiar religious notions of each individual mind. The Creator of the universe has promised to be with those who believe in him in that dark and fearful journey. The imagination cannot form a conception of the true state of the soul at the moment of its separation from the body. Poets and divines have attempted to convey a notion of its condition, but how vain have been their efforts!

A phenomenon attends the dying moments which I do not recollect to have seen noticed. A man fell into the water: he rose several times to the surface. He had a perfect consciousness of the hopelessness of his situation. With this conviction on his mind, he saw presented to him a picture of his past life; the minutest action in which he had been engaged was brought in a kind of *tableau* before him. Circumstances that had long been forgotten were conjured from his brain, and he had a bird's-eye view of his past life. Possibly this may occur to every person at the moment of dying.

It is rare for the insane to die in a state of mental alienation; they generally fall victims to some bodily disorder, and the mind is restored in some measure to a state of sanity before dissolution. Even where the most complete fatuity has been produced by long-continued mental derangement, an unsteady glimmering of reason occasionally returns. The mind appears to approach once more the throne of reason, to linger about the scenes in which it once delighted, and to recall, and that only for a moment, ideas which were once possessed, and which are about to be parted with for ever.

Sir W. Scott has not failed to notice this peculiar feature of mental derangement when describing Madge Wildfire's death-bed scene. The poor maniac, when consciousness has been restored, looks back with sorrow and shame at the crimes and misfortunes of her past life. The recollection of her once happy home is contrasted with her present situation, as an outcast on the bed of charity. The same phenomenon is represented by the immortal Cervantes in his account of the death of Don Quixote. Towards the termination of his illness he called his friends round his bed, and addressing them, said, "Let us return thanks to the Almighty, whose infinite mercy has just vouchsafed to confer upon me the most signal favour." On being asked what he referred to, he replied, that it was the most valuable faculty which man could possess, and the only one which could procure him a little repose in this wretched life, his reason; he then observed, that he had lost the use of his reasoning faculties by reading foolish books of chivalry and knight-errantry, but, he continued, I shall not live long to enjoy it. He then gave directions that his friend, the rector, the bachelor Samson, Nicholas, and his faithful Sancho, should be summoned to his bedside. Upon their arrival, Don Quixote addressed them, and said, "Make haste and congratulate me on being no longer Don Quixote of La Mancha, I am Alonso Quixano, who used to be called *the Good;* you no longer see in me the imitator of those imaginary heroes, whom, in my folly, I took for models, but one, whose mind being weak and insane, is able, at his last hour, to exercise enough of reason to repent of the folly of his past life." He then makes his will; leaves Sancho a considerable legacy. His faithful squire entreats his master not to die, to which Quixote replies, that he is not surprised that Sancho, having seen him so long mad, should find it difficult to believe that he is restored to the use of his reason. After receiving the sacrament he expires.

The sensations which are excited in the act of dying must be greatly modified by the character of the individual, and the part which he has had to play in the great drama of life. As in sleep, so in death the mind will exercise itself on those topics which have been most forcibly impressed on the imagination. Napoleon, when dying, and in the act of speaking to the clergyman, reproved his sceptical physician in these words,—"You are above those weaknesses, but what can I do? I am neither a philosopher nor a physician; I believe in God, and am of the religion of my father —it is not every one who can be an atheist." The last words he uttered— "Head," "Army," clearly evinced what visions were passing through his mind at the moment of dissolution. The last words of a celebrated judge were, "Gentlemen of the jury, you are discharged."

Dr Armstrong, when dying, seemed to take no notice of anything about him, nor did he appear to see those who were standing by his bed-side; he lay perfectly still, breathing quickly, with his eyes generally closed; and at intervals he spoke exclusively of his wife and his profession in a very hurried tone of voice, as if apprehensive that every moment might be his last. He would use the tenderest epithets in speaking to the former, and then address himself to one of his patients: at one time, in speaking of Mrs Armstrong as if she were present, he said,—"Quick, quick, dearest Sarah, some filtered water to wash my mouth." Then, after a brief pause, he said, as if advising a patient, "It is not amaurosis; the pupil of that eye is as regular as the other." Again he said, "Live by strict rule; do not eat much. These conditions form rapidly, and must be prevented. Purge them freely."

It is said that the dying hours of Charles IX, of France, were rendered horrible by his fancying that he heard a repetition of the groans and shrieks which had assailed his ears during the massacre of St Bartholomew. In early life this monster had been noted for his cruelty; nothing afforded him greater pleasure than cutting off the heads of asses and pigs with a single blow from his *couteau de chasse.* After the massacre he contracted a singularly wild expression of countenance, and slept little; he attributed his thirst for human blood to the circumstance of his mother having at an early period of life familiarized his mind with the brutal sport of hunting bullocks, and with all kinds of cruelty. It is said that when dying he actually sweated blood. The death of Cardinal Beaufort, who was accused of having murdered the Duke of Gloucester, is said to have been one of the most terrific scenes ever witnessed. Despair in its worst form took possession of his mind at the last moment. According to Harpsfield,* his dying words were,—"And must I, then, die? Will not all my riches save me? I could purchase a kingdom, if that would save my life. What! is there no bribing death?" How terrifically Shakspeare has delineated the last scene in the Cardinal's life: it is difficult to know which most to admire, its historical accuracy or poetical beauty.

How deeply interesting it is to contemplate the death-bed scene of those whose fame will be imperishable, so long as genius is admired, or science, art, and literature cultivated.

It is said that Haller, the great physiologist, died feeling his pulse. When he found that he was almost gone he turned to his brother physician and said, "My friend, the artery ceases to beat," and died.

Petrarch was found dead in his library leaning on a book. Bead died in the act of dictating. Roscommon uttered at the moment he expired two lines of his own version of 'Dies iræ.'

Rousseau, when dying, ordered his attendants to place him before his window, that he might once more behold his garden, and bid adieu to nature.

Addison's dying speech to his son-in-law was characteristic of the author of the 'Spectator.' "Behold," said he to the dissolute young nobleman, "with what tranquillity a Christian can die!"

Alfieri, the day before he died, was persuaded to see a priest, and when he came he said to him with great affability, "Have the kindness to look in to-morrow; I trust death will wait four-and-twenty hours."

Tasso's dying request to Cardinal Cynthia was indicative of the gloom which haunted him through life; he had but one favour, he said, to request of him, which was that he would collect his works and commit them to the flames, especially his 'Jerusalem Delivered.'

Clarendon's pen dropped from his fingers when he was seized with palsy, which terminated his life.

Chaucer died ballad-making. His last production he entitled 'A Ballad made by Geoffry Chaucer on his death-bed, lying in great anguish.'

Sir Godfrey Kneller's vanity was displayed in his last moments. Pope, who visited him two days before he died, says he never saw a scene of so much vanity in his life; Kneller was sitting up in bed contemplating the plans he was making for his own monument.

"I could wish this tragic scene was over," said the celebrated actor Quin; "but I hope to go through it with becoming dignity."

Bishop Newton died whilst in the act of setting his watch.

Bayle having prepared his proof sheet for the printer, pointed to where it lay when in the act of dying. The last words of Lord Chesterfield were when the valet, opening the curtains of the bed, announced Mr Drysdale, "Give Drysdale a chair." Warren observed that Chesterfield's good breeding only quitted him with his life. "Tell Collingwood to bring the fleet to an anchor," were Nelson's last words. "I fear not death! Death is not terrible to me," said Charles the First when he ascended the scaffold. Sir Thomas More, on observing the weakness of the scaffold on which he was about to die, said to the executioner, "I pray you see me up safe, and for my coming down let me shift for myself."

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* 'Hist. Eccles.,' edit. duaci, 1622, p. 643-4.

In the preceding observations I have endeavoured to convey some idea of the physiological phenomena perceptible at the moment of death. Notwithstanding all that has been written by metaphysicians and medical philosophers, this important and interesting subject remains in great obscurity. Our notions of the mental and physical condition of the system during the last fearful conflict must, to a great extent, be hypothetical. Of the subtle principle of vitality our knowledge is very imperfect; of the nature of that mysterious union between mind and matter we know literally nothing; how, then, is it possible for finite understandings to penetrate through the veil which envelopes that crisis in our "eventful history," when we pass from this changeful state of being to that mode of existence which is involved in the deep and sombre shadows of eternity?

CHAPTER III.

ON MALARIA.

The term malaria literally signifies *bad air*. It is derived from the Italian, and is formed by the coalescence of two words, *mala* and *aria*. Every impurity of the atmosphere is not, however, called malaria ; at least it is not supposed to be the result of a decomposition of animal and vegetable matter, the common and ordinary source of malaricus poison. It is also designated marsh-miasm, in consequence of its being generally discovered in the vicinity of marshes and swamps. The investigation of this subject has been much neglected by those whose special duty it is to discover the true origin of diseases, and to suggest means for their removal. Much difficulty no doubt environs the subject. Like most other poisons, malaria is capricious in its action, inscrutable in its nature, and appears to be under the influence of no uniform laws. Although it is said to be the effect of the decomposition of vegetable and animal substances, and to be always found in the neighbourhood of marshy districts, yet it is occasionally seen where no vegetable is to be detected, and no marsh exists. Notwithstanding, however, the difficulties which impede the investigation of the inquirer, a large amount of valuable information has been collected on the subject of malaria, by which some notion may be obtained of the peculiar conditions under which it is originated, and the laws which govern its action on the animal economy. This subject is not exclusively of importance to the professional man, but it is one in which every individual member of the community feels a deep interest. It has been justly observed, that if the sword has slain its thousands, malaria has slain its tens of thousands. It is disease, not the field of action, which digs the grave of armies ; it is malaria by which the brave and intrepid spirit, fitted for better things, is quenched. This is the destroying angel, the real pestilence which walks at noonday, and to which all the other causes of mortality are but as feeble auxiliaries in the work of destruction.

In order to form an accurate conception of the destruction to human life caused by malaria, we have only to compare the average duration of life in countries free from its influence with those where it is known to exist in all its virulence. The average of life in this country may be said to be fifty, In Holland it is only 25; the executioner is malaria. There are districts in France where the average is but 22, 20, and 18. "Let us turn," says Dr Macculloch, "to Italy; the fairest portions of this fair land are a prey to this invisible enemy; its fragrant breezes are poison, the dews of its summer evenings are death. The banks of its refreshing streams, its rich and flowery meadows, the borders of its glassy lakes, the luxuriant plains of its overflowing agriculture, the valley where its aromatic shrubs regale the eye and perfume the air, these are the chosen seats of the plague, the throne of malaria. Death here walks hand in hand with the scenes of life, sparing none: the labourer reaps his harvest but to die, or he wanders amid the luxuriance of vegetation and wealth, the ghost of man, a sufferer from his cradle to his impending grave, aged even in childhood, and laying down in misery that life which was but one disease. He is driven from some of the richest portions of this fertile yet unhappy country; and the traveller contemplates at a distance deserts, but deserts of vegetable wealth, which man dare not approach,—or he dies:—

'In florid beauty groves and fields appear,
Man seems the only growth that dwindles here.'

Nor does his houses and towns afford him a shelter against the all-pervading pestilence. It enters with him into his chambers, and stalks through his streets. Imperial Rome herself is its chosen victim: man flies before it, but the enemy is behind him, around him, and on all sides; every day sees the dominion of death extended, and the hour is impending when the eternal city shall cease to be—when it shall submit to that fate which has been the fate of proud Nineveh, and Babylon, the Queen of Nations."

The principal affections which malaria gives rise to are intermittent fever (commonly termed fever and ague) and remittent fever. It is also believed by many that yellow fever, influenza, and the plague may also arise from the same cause. The fact of yellow fever, cholera, and plague being contagious maladies, does not lessen the probability of such a supposition; for I can well suppose a disease malarious in its origin, which may afterwards be propagated from one individual to another.

If malaria does not produce any of the specific affections enumerated, an exposure to its influence often gives an epidemic and intermittent character to other diseases. Very often the general health becomes considerably impaired by malaria, without either the patient or his medical attendant having the slightest suspicion of the cause of the disorder. The man of observation cannot but have noticed the peculiar malarious complexion which so prominently marks the countenances of those resident on the banks of the Thames. During low tide a very large portion of muddy bank on the side of the river, upon which every description of vegetable is collected, is exposed to the rays of the sun, and decomposition takes place, and malaria in large quantities is evolved. With a knowledge of this fact, is it not surprising that many of the nobility and aristocracy should have selected as sites for their habitations a situation which, above all others, should have been avoided? The residence of Sir R. Peel, and the position of the Duke of Northumberland's mansion, are most unhealthy localities. The same may be said with reference to all the houses on the banks of the river Thames. More disease prevails on the Southwark side than upon the opposite. This fact may be attributed to the circumstance of the nobility and aristocracy being less predisposed to the affections caused by malaria than are those who reside in the small, ill-ventilated houses on the Southwark side of the Thames. The generous living in which the aristocratic portion of the community are able to indulge, also acts beneficially in preserving them from the destructive effects of malaria.

In a discussion which took place at the Westminster Medical Society, Dr Addison, physician to Guy's Hospital, says, in alluding to the site of Buckingham Palace, that "Dante himself would have been pleased with the view of this miserably situated edifice, as taken from Piccadilly by twilight, the lamps flitting in a perpetual fog like so many evil spirits. On a beautiful morning, when all around was bright, Buckingham Palace was enveloped in fog or smoke." Dr Johnson stated, that "Buckingham Palace, which was situated twelve or fourteen feet above the level of the water in the park, was not so badly situated as Spring Gardens, for during nine months of the year the south-west winds were blown over the park towards it." He (Dr J. Johnson) who had passed harmless through many countries in which malaria was most destructive, caught an ague which lasted for many months during his residence in Spring Gardens.

Sir James Clark, who has had extensive experience of malarious diseases and localities during a long residence in Italy, says, "It may be stated as a general rule, that houses in confined and shaded situations, with damp courts and gardens, or standing water close to them, are unhealthy in every climate and season; but especially in a country subject to intermittent fevers, and during summer and autumn. In our own country nothing is more common than to see houses built in very unhealthy situations, a few hundred yards distant only from a good one. Again, houses in places otherwise unexceptionable, are often so closely overhung with trees as to be rendered far less healthy residences than they otherwise would be. Thick and lofty trees close to a house tend to maintain the air in a state of humidity, by preventing its free circulation, and by obstructing the free admission of the sun's rays. Trees growing against the walls of houses, and shrubs in confined places near dwellings, are injurious also, as favouring humidity; at a proper distance, on the other hand, trees are favourable to health. On this principle it may be understood how the inhabitants of one house suffer from rheumatism, headache, dyspepsia, nervous affections, and other consequences of living in a confined humid atmosphere, while their nearest neighbours, whose houses are more openly situated, enjoy good health; and even how one side of a large building, fully exposed to the sun and to a free circulation of air, may be healthy, while the other side, overlooking damp, shaded courts or gardens, is unhealthy.

"The exemption of the central parts of a large town from these fevers is partly explained by the dryness of the atmosphere which prevails there, and the comparative equality of temperature. Humid confined situations, subject to great alternation of temperature between day and night, are the most dangerous. Of all the physical qualities of the air, humidity is the most injurious to human life; and therefore, in selecting situations for building, particular regard should be had to the circumstances which are calculated to obviate humidity either in the soil or atmosphere in every climate. Dryness, with a free circulation of air and a full exposure to the sun, are the material things to be attended to in choosing a residence. A person may, I believe, sleep with perfect safety in the centre of the Pontine Marshes by having his room kept well heated by a fire during the night."

Few have had such favourable opportunities for estimating the effects of malaria as those who have resided at Rome, and in some parts of France and Holland.

It has been a question with medical historians, whether, in the early period of Roman history, malaria exercised that pernicious influence it has been known to do in more recent times. There can be no doubt but that Rome was very unhealthy during particular seasons at an early period of its history, when that city was at the height of its glory, and considered, '*terrarum domina gentiumque.*'

> "The mistress of the world, the seat of empire,
> The nurse of heroes, the delight of gods,
> That humbled the proud tyrants of the earth,
> And set the nations free."

This source of disease appears to have escaped attention. In proportion as she declined in power, and the inhabitants became degenerated, less attention was paid to the cultivation of the land, and malaria was generated in large quantities. It is among the inhabitants of the Campagna di Roma that this poisonous exhalation is seen to exercise its terrific morbid influence. The *miasmata* at Rome appears to be dangerous in proportion to the warmth and moisture of the season; its effects, however, are much felt early in the summer, especially in that part which is much frequented by strangers, viz., the Piazza del Popolo and Strada del Babuino. Owing to this circumstance, few travellers visit Rome before November, or sojourn in Rome after Easter. The majority who suffer from malaria are those who have imprudently exposed themselves to the influence of the night air. Persons residing in that city during the unhealthy seasons should be careful to avoid sleeping in the infected districts.

Dreadful, however, as is the picture drawn of the effects of malaria among the inhabitants of the Campagna di Roma, it is not half so appalling as that of the ill-fated inhabitants of Basse Bresse, Brenne, Sologne, and Dombes. The destructive effect of malaria in those places is attributed to the mode in which the land is cultivated. It is alternately formed into ponds, and then subjected to tillage. For the space of eighteen months or two years the land is overflowing with water; at the expiration of that period the water is allowed to run into adjoining fields. The land is then cultivated for two or three years, and is then again formed into a pond. In addition to the marshes and ponds, numerous woods surround the humid plains which intercept the circulation of the air, in consequence of which the whole country is rendered uninhabitable. The condition of the labourer is most lamentable. He enters into the wet land soon after the water is drained off, for the purpose of cultivating it. For whole days his legs are immersed in a pestiferous marsh, imbibing through every pore the most destructive exhalations. "Il est rare," says M. Fodéré, "que de quatre travailleurs deux n'y succombent pas."*

The picture given by Fodéré of the physical and moral abjection that characterizes the inhabitants of the pestiferous localities of France, is deplorable. "From his earliest infancy, man begins to experience the sad effects of this unhappy country. He is scarcely weaned before his complexion becomes sallow, and his eyes assume a bilious tint. He falls away, his growth is arrested, his viscera become engorged, and he attains with difficulty his seventh year. If he clears this term, he does not live—he vegetates—he continues doughy, obstructed, cacochymous, bloated, hydropic, liable to malignant putrid fevers, to interminable autumnal fevers, to passive hemorrhages, and to ulcers of the legs, extremely difficult of cure. In perpetual strife with all these diseases, which frequently attack him at once, so that he may be almost regarded as in a protracted agony, the inhabitant of Brenne attains the age of twenty or thirty years, when nature begins to retrograde, the faculties sink, and the age of fifty years is commonly his final term. In this manner several generations rapidly pass away. The population, however, maintains pretty nearly an equilibrium. They marry early and repeatedly. It is not uncommon to find men and women, 30 or 40 years of age, married for the third or fourth time. The three brothers Dupont, one of whom is a widower, have married fifteen women amongst them. The certainty of finding vacant habitations and lands to let attracts foreign families, day labourers and hired servants proceed thither, marry and settle; and in this way the problem is resolved, why so inhospitable a country is not depopulated."*

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* A gentleman was exposed to the emanations from a drain or sewer which had become obstructed in his own house in London. He was soon afterwards seized with an ague, although he had not been out of the metropolis for years. The ague was easily cured by the proper remedies; but for a long period it harassed him in quite a different shape, namely, in that of a sudden dread of he knew not what. It usually occurred at the same hour of the day, and would last from two to three or four hours, during which the individual suffered the miseries of the damned. Indigestible food or anxiety of mind was sure to conjure up the ague fiend. It was always checked by change of air to the coast; but, like all malarious affections, was easily re-excited. I knew hundreds of people who had been exposed to malaria in hot and unhealthy climates, and who were harassed for years after their return to their country by these periodical horrors, for I can give them no other name.—*Dr Johnson.*

With reference to this subject, the following points are deserving of attentive consideration. First, as to the geographical position of malarious countries; secondly, the conditions of the soil and atmosphere necessary for the production of malaria; thirdly, the nature of the poison; and lastly, the means best calculated to protect the body from its morbid influence, and to render the districts, now so destructive to human life, healthy. The malarious districts in England are situated principally on the eastern coast, in the low counties of Essex, Cambridgeshire, Lincolnshire, and the East Riding of Yorkshire. Holland is a low, malarious country. There is hardly a town on the banks of the Scheldt free from disease caused by malaria. In France there exists 900,000 acres of undrained alluvial soil, the inhabitants of which are liable to intermittent and remittent fevers, the production of malarious poison. A similar country exists about Seville, Cadiz, and many other towns on the southern coasts of Spain. In Italy also, the Mantuan, the Florentine, and Roman territories, the whole tract of the Pontine Marshes,† the islands of Minorca, Sicily, Sardinia, the

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* Traité de Médecine légale et d'Hygiene, publique, t. v, p. 166.

† "It is in these destructive swamps that the malarious physiognomy, which merely indicates bad health in other places, rises into that hideous deformity which accompanies lingering death under multiplied sufferings. The frame of man appears there like a nosological picture, in which all the great mortal maladies of human nature have their frightful but faithful representatives The 'foul fiend' of the fens, ague fever, claims presidency; on his right sits liver-grown jaundice, with bloated dropsy on its left. Around these, marasmus, palsy, mania, melancholy, swellings, pains and hectic burnings, take their respective stations, and play their tragic parts. In short, the pale tenement of the immortal mind is here a living carrion, on which the vulture of malaria plays for months and years, before the friendly grave interposes its arm of protection against their torturing depredations. The punishment of Prometheus is no fable. It is here verified to the letter." In another part of his interesting work, Dr Johnson, in alluding to the malarious physiognomy of the inhabitants of the Lombardo-Venetian plains, says, "It is neither a yellow nor sallow complexion, but an unsightly compound of two, a never-failing effect of malaria, whatever be the parallel of latitude, whether on the pestiferous plains of Beveland or of Batavia; to the experienced eye, the features, the whole countenance, present infallible indications of a slow poison circulating

Ionian islands, and the northern shores of Africa, malaria exerts its destructive influence. The West India islands are notorious for their unhealthiness; like the great continents of America and Asia, these islands consist of one conical mountain, or a series of mountains, bordered by a margin of alluvial soil. In order to obtain protection from the hurricanes, the towns are situated on the leeward shore, on a level little above that of the sea. Thus placed and enclosed by high hills, which exclude the breeze and reflect most intense heat on the low lands, where the settlements of the planters are formed, we cannot be surprised at the existence of the severe fevers which prove so destructive to the lives of the inhabitants of those islands.

Ague was, at one period, very prevalent in London and its neighbourhood, in consequence of the existence of certain marshes. Southwark was once an entire swamp, and at Westminster there is a toll-gate called the "Marsh-gate," from being situated in a place where there formerly was a marsh. Not very long ago the banks of the Thames, from Lambeth to Woolwich, were one continued swamp. These parts have been supposed to be deprived of their destructive qualities by being underdrained, and by the formation of sewers. It is generally believed that marshy places are rendered wholesome by being built over. This is not always the case. The Penitentiary at Millbank was built upon a marsh, and as the residence was found too unwholesome for convicts, it was said that government intended it for barracks. Three out of five of its inmates are affected with miasmatic disease.

Taking the whole area of England and Wales, the number of inhabitants to the square mile is 265. The population is, however, very unequally distributed. In agricultural districts the people are very thinly scattered, and in the metropolis and provincial towns the population is more dense. In the metropolitan unions of St Giles and St George, Bloomsbury, the Strand, the City of London, East and West London, Holborn, St George in the East, and St Mary, Whitechapel, the number of inhabitants to the square mile is 123,904. In the heart of English cities there is nearly 243,000 inhabitants to a geographical square mile. This concentration of so large an amount of population within so limited an area, is found to double the mortality from contagious and epidemic diseases in cities, when compared to the country. The cause of the higher mortality in cities undoubtedly results from the insalubrity of the atmosphere. It has been clearly established, that every human being expires about 666 cubic feet of gas daily, which, if collected in a receiver, would destroy other animals; and is constantly producing, in various ways, the decomposition of animal and vegetable matter, yielding poisonous emanations in houses, work-shops, dirty streets, and bad sewers. The smoke of fires and the products of combustion are also poisonous. All gases and effluvia, like odours, are diffusible; and all the emanations from human habitations in the open country, mingle, almost as soon as they escape, with the current of the atmosphere. Instead of one individual being located to a square mile (the supposed density of population in the uncultivated forests of America and the steppes of Asia), let 200,000 human beings live in a square mile, like soldiers in a camp, and the poison of malaria will be concentrated 200,000 fold; intersect the space in every direction by 10,000 high walls, overhanging the narrow streets, exclude the rays of the sun, intercept the movements of the atmosphere, let the

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with the current of the blood through every organ of the body, and gradually sapping the foundation of health and life."

rejected vegetables, the offal of slaughtered animals, the filth produced in every way in the houses and courts, stagnate in the wet streets, bury the dead in the midst of the living, and the atmosphere will become an active poison, and will destroy, as it does in Constantinople, 5-7ths per cent. of the inhabitants, and generate, when the temperature is high, plagues and pestilences of the most destructive character. The only mode of diminishing mortality in cities, and in any place where the population is dense, is by purifying the air. Supply the 200,000 persons occupying a square mile with 200,000 cubic feet of pure air daily, and remove all poisonous exhalations, and a great source of disease will be removed. Mr Farr, in his very able letter to the Registrar-General, to which I have been much indebted, suggests, as the best mode of improving the health of the metropolis, the establishment of a good general system of sewers, and intersecting the dense, crowded districts, by a few spacious streets. He also proposes to form a park at the east end of London, by which he thinks thousands of lives might be annually preserved.

Three conditions appear to be essential to the formation of malaria, viz., moisture, heat, and the presence of vegetable matter. It was at one time supposed that malaria would exist in proportion to the degree of moisture that was present, but this notion is proved to be fallacious. The fishermen, who live for months immersed in the dense fogs on the banks of Newfoundland, are not subject to intermittent fevers. On the western side of England, the inhabitants are subject to much more rain than are those who live on the eastern coast, and yet the former are not so liable to ague as the latter. The inhabitants of Wales and Cumberland, where there is much rain, are little subject to malarious affections. In the West Indies the mortality from malaria is not at its maximum in those parts where there is the greatest quantity of rain. Double the quantity of rain falls in British Guiana than in Jamaica, but the mortality of the troops is only half as great in the former as in the latter. The Malabar coast, the healthiest quarter in the Madras presidency, is deluged with rain six months in the year. The extremes of heat and cold, dryness and moisture, are unfavourable to the generation of malarious poison. When meat is decomposing, we have only to cook it to arrest the putrefactive process. Meat may be preserved for a very long period in cold weather. In the most pestilential countries in tropical climates, the hottest season of the year is the most pleasant and healthy. In the polar regions the decomposition of vegetable matter is so slow, that even the marsh is healthy.

A certain quantity of heat and moisture is necessary to produce decomposition and malaria. Dryness prevents putrefaction. In dry weather, a swamp, which previously produced a large amount of malaria, may become quite innocuous. Extreme moisture has also the same effect; in consequence of the excess of fluid impeding putrefaction, a river breaking over a marsh has prevented it from any longer being the source of noxious exhalations. In Batavia the rainy season is healthy, in consequence of the rivers and canals being plentifully supplied with water, and all the marshes inundated.

Numerous facts establish, beyond the possibility of a doubt, that the putrefaction of vegetable matter is indispensable to the presence of malaria. Although it may not always be in our power to detect the presence of vegetables in every pestilential situation, still we cannot doubt for a moment that decomposition must have taken place. In order to produce the putrefactive process, a certain degree of moisture and heat is necessary; this I shall presently demonstrate.

When the crops are growing malaria is not generated; but when the harvest takes place, large quantities of vegetable matter are left on the ground, which upon undergoing decomposition give rise to most destructive diseases. A most severe epidemic fever nearly depopulated the ancient town of Urbs Vetus, in consequence of the peasants steeping flax in some stagnant water in the neighbourhood of the town. In India, after the indigo was extracted from the plant, it was the custom to throw the detritus into large masses in the neighbourhood of the works. When this was moistened, and acted upon by the vertical rays of the sun, the most pestilential malaria was engendered. A very severe fever was generated on board the 'Priamus' frigate in consequence of some chips and shavings being allowed to remain, and to mix with the bilge water under the timber boards. Ships laden with sugar have the greatest mortality, in consequence of sugar being a vegetable matter. Dr Elliotson states, that the most unhealthy cargo a ship can carry is sugar.

When the earth has become parched and caked, and much vegetable matter is lying on it, as soon as the rains fall putrefaction instantly commences, and the ground emits an offensive odour, and the most fatal diseases ensue. In 1745 the country around Breda was inundated ; after the peace the waters were let off, and the ground which had been covered was exposed to the rays of the sun ; a very severe fever followed, and the epidemic was stopped by again letting loose the water on the country.

Some countries, particularly where new settlements are formed, are very free from malaria until the soil is cultivated and the land cleared. This admits of an easy explanation. Everything that increases the decomposition of vegetable matter produces malaria. In breaking up the land, a large quantity of vegetable matter is destroyed ; this putrifies, and generates malaria. In all countries very severe fevers have been generated by breaking up the surface of the earth. Volney, the traveller, has noticed this to invariably happen in America. The same result ensues on clearing away woods, which let a large quantity of malaria loose which previously was pent up and confined within certain limits. In clearing the land, by cutting down the trees, much vegetable matter is destroyed, and the sun having free access to it, decomposition goes on very rapidly. A small bush, situated between a malarious district and a village, has been known to intercept the passage of the poison. A village has been remarkable for the health of its inhabitants until a wood has been removed. It is supposed that it was a knowledge of these facts that caused woods to be held so sacred, and to be so venerated in ancient times.

In tropical climates, and in hot seasons in temperate countries, where malaria is found in the greatest abundance, large quantities of animal matter are seen in a state of decomposition. "The circumstances," says Dr Copeland, "which render vegetation gentle and luxuriant, generate immense swarms of insects and reptiles, the exuviæ and dead bodies of which mingle with vegetable matter in a state of decay, and give rise to malaria, particularly during moist states of the air, much more noxious than those resulting from vegetable matter alone." Dr Copeland has considered the number of insects and reptiles with which a place abounds as much more indicative of its insalubrity than almost every other circumstance.

The amount of disease in marshy districts will greatly depend on the calmness of the air in the immediate vicinity of such localities. However potent the malaria may be in a particular spot, its effects will be but slightly felt if there be a quick renewal of the atmosphere, preventing the stagnation and concentration of the effluvia. If the air be in a quiescent state, the malaria accumulates in the lower strata and in circumscribed limits. In consequence of this, much danger arises from exposure to the sources of malaria during still and humid states of the atmosphere, at the close of the day, when it is condensed in the descending moisture; or at night, or approaching dawn, when it is unrarefied by the solar heat, and not yet carried to the higher regions by the ascending or vertical currents of the atmosphere. High winds, hurricanes, and thunder-storms are of the greatest benefit in malarious districts, by dispersing, and sometimes altogether sweeping off, the exhalations from the soil. The violent commotions in the air dissipate the noxious poison, and prevent it from accumulating in spots where it is generated. "It has been observed," says Dr Copeland, "especially in warm climates, and in hot seasons in temperate countries, that when the air has been long undisturbed by high winds or thunder-storms, and at the same time hot and moist, endemic diseases are very severe, and even assume an epidemic character. It is generally in miasmatic countries, and after prolonged seasons of drought, and still states of the air, that tornadoes occur in hot climates, and thunder-storms in temperate countries, purifying and refreshing all the objects exposed to them, and preventing the occurrence of those severer forms of disease that would otherwise have arisen."*

Malaria is often generated in situations where you would not have the slightest suspicion of its existence—where the grass looks fresh and green, and no decomposition is perceptible. Dr Elliotson relates the case of a friend of his who was travelling in Syria. He saw a spot of grass, fresh and green, though rather moist. As he was in the act of pitching his tent, he was warned not to do so if he valued his life. He was told that whoever remained on that spot during the night was sure to be attacked with fever. There was nothing in the appearance of the spot which would have led to that conclusion.

It is stated in a work recently published, that plants form an excellent barometer or measure of the atmosphere, and we may rely on them with much confidence for such an object. The growth of the March plants, juncus, larex, iris, calletriche, potamogeton, sium, hydrocotyle, ranunculus, typha, lemna, &c., is a strong proof of the presence of an atmosphere unfavourable to the production of fevers.†

Harbours, moats, and mill-dams are frequently the source of malaria. How often have severe intermittent fevers arisen from the decomposition of vegetable matter in small ponds, in the neighbourhood of mills, without the cause having been detected. A whole family has been attacked by intermittent and remittent fever, produced by malaria, generated in a small basin of water, in which vegetable matter has undergone decomposition.

It was at one time believed that animal matter, in a state of putrefaction, would yield malaria; but this notion is not now entertained. In confirmation of the statement that decomposition of animal matter is not productive of malaria, the fact that the tainted air of a dissecting-room is often breathed for months together, without producing any epidemic fever. is often referred to. M. Londe remarks, that in a single scholastic year of the *Faculté de Medicine* of Paris, sixteen hundred subjects of both sexes, and of all ages, are dissected by five hundred medical students, who pass, on an average, from five to six hours daily in the dissecting-room, breathing an atmosphere completely impregnated with animal matter in a state of high putrefaction. The rooms were also cold and damp. Amidst these strong predisposing causes of disease, none of the students were known to suffer from ill-health.

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* Dictionary of Prac. Med.—Art.: "Endemic Diseases."

† Spas of Italy.

The plague has its great nidus at Grand Cairo. This pestilence has been considered to result from the crowded population, poverty, filthy narrow streets, hot climate, and filth of the canals of that city. But most of these elements are present in other cities where the plague does not exist. The Jews' quarter at Rome, the *Judaicum*,* the most filthy part of the city, is singularly free from malarious diseases, while the elegant streets in the neighbourhood suffer very severely. Lisbon has been immortalized for dirt, and yet there is no plague. Byron's description of that "noisome metropolis" is well known :—

> "But whoso entereth within this town,
> That sheening far celestial seems to be,
> Disconsolate will wander up and down,
> 'Mid many things unsightly strange to see,
> For hut and palace show like filthily,
> The dingy denizens are reared in dirt;
> No personage of high or mean degree
> Doth care for cleanness of surtout or shirt,
> Though shent with Egypt's plague, unkemp't, unwash'd, unhurt."

In many instances much difficulty has existed in establishing any uniform connexion between the presence of marshy ground and the existence of those febrile diseases to which malaria is supposed to give rise. Remittent and intermittent fever prevailed to a great extent in some of the Ionian Islands among the British troops, yet there existed no marsh, and the islands were comparatively barren of vegetation. Yellow fever has repeatedly made its appearance at Ireland Island, in the Bermudas, a rocky, barren spot, only a few hundred yards in breadth, containing no marsh, and with little or no vegetation except a few cedar trees. Numerous facts warrant us in believing that malaria may arise in places where no marsh can be detected, and where the soil is dry and the ground elevated, particularly in volcanic districts; this is the case in the territory called the Maremma, in Italy, a district which reaches from Leghorn to Terracina; it is a tract of country near the sea, varying in breadth, according to Chateauvieux, from thirty to forty miles, and being in length about 192 geographical miles. The diseases produced by the malaria of this district are principally ague and remittent fevers. Again, it is found that miasmal affections prevail to a remarkable extent along the banks of the lakes and the margin of the streams in Upper Canada, while they are comparatively rare in similar situations in the lower province. Among the troops at

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* Dr J. Johnson thus describes the Jews' quarter at Rome :—" I strolled one day into a quarter where the filth of the streets and the features of the people assumed a different cast from what the eye had been accustomed to in the city generally. An observance of the seed of Abraham, wherever planted, between China and Peru, convinced me that, however climate may blanch or tinge the complexion, the Hebrew features will remain the same in any parallel of latitude or longitude. No one can traverse that part of Rome which lies between the Capitol and the Isola Tiberina, without perceiving that he is in the midst of one of the tribes of Israel. Poor Moses is obliged to take out an expensive licence for permission to see the light of heaven, whether under the cross or the crescent! It would be difficult, however, for human ingenuity or malice to devise a more cruel or ignominious tribute for breathing the mephitic atmosphere of the Campagna than what the Romans have imposed on the Jews—that of being more filthy than themselves."

Fredericton, living on the marshy banks of a river, surrounded by dense vegetation, scarcely a case of malarious disease is ever known. A similar exemption is enjoyed at the *embouchure* of rivers daily subjected to extensive inundations, and of which the banks, for a distance of several miles, exhibit that combination of mud, marsh, and decayed vegetation, which is generally supposed to be a most prolific source of febrile diseases.

The dry and healthy climate of Minorca is sometimes attacked with remittent or intermittent fever, while Sardinia, proverbial for its insalubrity and febrile epidemics, escapes. "In the year 1812," says Dr Macmichael, "I was detained several months at Trichiri, a small sea port in the mouth of the gulf of Volo, in Thessaly. The town is built on a dry limestone rock, but it is notorious for malaria. During my stay here I made an excursion to visit the celebrated pass of Thermopylæ, and slept one night near the marshy district in that neighbourhood. On my return, the friends whom I had been waiting for arrived from Athens, and we all embarked on board a Greek vessel, to cruize in the Archipelago. On the following day I was seized with a most severe fit of the ague, and at the same time a servant belonging to the party suffered a similar attack. It might be said that I had caught my intermittent at Thermopylæ, but the servant had not quitted the dry rock of Trichiri, upon which he had remained more than a week." In like manner Sir Gilbert Blane informs us, that while the village of Greenhithe, nearly on a level with the marsh of Northfleet, is unaffected with intermittent fevers, the adjacent hills suffer considerably from them ; and he refers to other anomalies of the same kind.

In Ireland there are 700,000 acres of marshy or bog districts. It has been a matter of surprise that the inhabitants in the vicinity of these bogs should be so exempt from the affections which are known to be caused by malaria. Dr Williams has satisfactorily accounted for this anomaly. He says that the bogs contain very few vegetables that have a tendency to run rapidly into decomposition. They principally consist of mosses, interspersed with a small portion of heath, fern, and a few grasses. The decomposition of the bog moss is so very slow that it can scarcely be said to rot in water, and it possesses a vitality so great, that when dried, and apparently dead, it may be revived on again placing it in water. Neither its leaves fall off, so as to afford any quantity of dead vegetable matter; and, in the opinion of botanists, the plant is destroyed solely by the weight of the successive shoots sinking it deeper and deeper below the surface of the water, and thus depriving it of atmospheric air. From this cause it undergoes an imperceptible decay, and, consequently, the decomposition is too slow to afford any sensible quantity of marsh miasmata.

It appears, also, that peat contains a considerable portion of *tannin*, a well known antiseptic, and in such quantity that, acting on the ferruginous waters of the bog, it changes the colour of the trees buried beneath its surface to a deep black. The peat bog has the property, not only of preserving vegetables, but animal substances, from putrefaction, so that, according to Dr Bancroft, not only plants and trees, but even human bodies, with their clothing, when completely immersed in a peat soil, will scarcely undergo any change during a long course of years.*

It has been an interesting point to ascertain what is the degree of elevation, in the neighbourhood of marshes, which will afford entire protection from the influence of malaria. The Monte Mario, adjoining Rome, is 165 yards above the Pontine Marshes, and is extremely unhealthy. Tivoli, which is 230 yards above the level of the same marsh, is more salubrious.

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* On Morbid Poisons.

An elevation of 2,500 feet gives either a complete exemption from malaria, or very much modifies its influence. Humboldt says, that yellow fever is unknown at the height of 2,500 feet above the level of the sea. Dr Fergusson states, that he has seen troops mount the night guard in perfect health in the dock-yards and among the marshes of Antigua, and be seized with furious delirium while standing sentry, and when carried to the barracks on Monk's Hill, expire in all the horrors of black vomit within thirty hours from the first attack. But during this time not a single case has occurred among the inhabitants of Monk's Hill, a rock rising perpendicularly to the height of 600 feet above the level of the same marshes. This phenomenon is said to be the result of difference of temperature in low and elevated situations, causing a larger quantity of malaria to be set free in the former than in the latter situation.

M. Rigaud de l'Isle has asserted, that the miasmatic particles which infect the air in its loftier and lighter strata may be separated from it. He tells us that he has found an elevation of 300 yards above the Pontine Marshes themselves a complete security from infection, and he proposes for those who reside lower to sift the air which they breathe by wearing a fine silk gauze over the mouth and nostrils. M. Brocchi has successfully employed the same remedy, and hence recommends sleeping under a fine mosquito net in all places where intermittents are endemic.

A place may, however, be extremely elevated, and yet be subjected to marsh miasmata. The Castle of Flamondville, in Normandy, is highly situated; but an endemic fever prevails round it in consequence of a moat, containing a large quantity of vegetable matter, which gives forth a pestiferous effluvia. The same thing has been observed in the neighbourhood of many castles. The Tower was at one period a very unhealthy situation in consequence of the neglected and filthy condition of the moat which surrounded it. More attention is now paid to it than formerly, and less disease results. Very frequently persons living in the lower part of a house are seized with malarious disease, while those residing in the upper story escape. In 1781, at St Lucia, one regiment, situated at the top of a hill, lost 271 men from intermittent and remittent fever; another regiment on the sides of the hill lost 318 men; and a third, which stayed at the bottom of the hill, lost 480. In Italy the difference is so great, that an erect is known to be more safe than a sitting or a lying posture; on the contrary, the inhabitants of a village in the immediate neighbourhood of a pestiferous marsh may escape, when persons residing in a village situated at some distance, but in a lofty altitude, may be affected. The Convent of Camaldoli, three miles from Lake Agnano, suffers from ague—it stands in an elevated position. At Malta, the malaria produced under a cliff, never affects the spot itself; but produces direful consequences on a village situated above it.*

It is a mistake to suppose that malaria is confined to low countries. Bishop Heber says, that the Himalaya mountains of India are surrounded during two-thirds of the year with an atmosphere more pestilential than the Sunderbunds or the Grotto del Cano, which even the natives fear to go near, and which, during the rains, the monkies themselves are said to abandon. As he approached the forest, the whole horizon was wrapped in a thick white mist, called "essence of owl," the native name for malaria. He describes the inhabitants of the villages through which he passed as being a miserable race of human beings. Owing to obstacles being thrown in the way of the progress of rivers taking their rise in hilly countries, large watery morasses may be formed favourable to the production of the most pestilential form of malaria.

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* Dr Elliotson.

The poison of malaria has been known to extend at the distance of three miles from its source. Lancisi says, that as thirty ladies and gentlemen were making an excursion of pleasure up the Tiber, the wind suddenly shifted to the south, coming over the Pontine Marshes, and twenty-nine were instantly taken ill, only one escaping. The wind was impregnated with malarious poison. When Commodore Long's squadron lay off the mouth of the Tiber, the vessels that were close to the shore were affected, while the rest, lying a little farther off, escaped.[*] The difference of half a cable's length from the source of malaria has caused vessels to suffer or escape. It has been maintained that the hotter the climate the farther does the poison extend; that if the quantity of vegetable matter be great, and the heat intense, it produces its effects at a considerable distance; but that in cold countries the exhalations are milder in their nature. Sir Gilbert Blane says, that during the Walcheren fever some of the ships were only three thousand feet from the shore; and no person on board was seized with the fever which was raging on land. The same authority says, that when the ships watered at Rockford, he found that if they anchored so near the shore as to smell the land (the smell of land air being sometimes very perceptible at sea), they were affected; but if they were only two cables' length from the spot where they smelt the malaria, they escaped the contagion. At Pensacola a regiment lost 120 men and eleven officers who landed, while the whole crew of a man-of-war lying one mile from the shore remained perfectly healthy. Dr Macculloch asserts that malaria may be carried to an indefinite distance. He says it is often carried from the banks of the Thames over the Kent hills, even some miles from the coast. Dogs will smell the land long before it is visible, and the sea may be smelt very far inland; whales and sharks may be smelt, both powerfully and offensively, as far as the spouting of the animal is visible from the masthead, and therefore Dr Macculloch maintains, if these things can extend to such a distance, so may malaria and vegetable exhalations. Malaria often unites with fogs and clouds, and is carried to an immense distance.

Dr Elliotson says, that on the high road to Chatham and Feversham, comprising a distance of twenty miles, the effect of malaria is only noticed on one side of the road. The injurious lands which afford the malaria are situated about a mile off; but it is only detached houses on one side of a level road that suffer. Dr Bancroft was credibly informed that only one side of a particular street in Rome was affected by ague, or aguish diseases; and Baglivi says, that the healthy spots of Rome are separated from the unhealthy by a wonderfully short distance.

Malaria is much more destructive at night than during the day. No stranger can stop with impunity during the night on the road through the Pontine Marshes.[†] Dr Trotter says, "that in the 'Assistance,' in 1762, in a voyage down the coast of Guinea, we had scarcely a man indisposed. We wooded and watered at the island of St Thomas, and, with a view to expedition, a tent was erected on shore, in which the people employed on that service were lodged during the night. On the middle passage, every man who slept on shore died, while the rest of the crew remained remarkably healthy." Dr Lind mentions that, at Batavia, a boat belonging to the Medway was actually manned three times, every one having perished, and simply from the men having to attend duty on shore during the night.

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[*] Lancisi, 'De Noxiis Paludum Effluviis.' 1817.—Dr Lind, 'The Diseases of Hot Climates.'

[†] Sir James Clarke, in his admirable work on the climate of Italy, says that his friend Dr Slaney, when on his way from Rome to Florence in the end of July, passed one night at Boccano, a solitary pest-house, situated in a low swampy valley about twenty miles from Rome, noted for the insalubrity of its atmosphere, and which Professor de Mathæis has denominated "*Luogo d'Aria la piu infame nelle vicinanze di Roma.*" Of this Dr Slaney was well aware, and was chiefly induced to risk sleeping in a place of such danger from the fear of injuring an invalid who was travelling with him. The doctor was attacked with the disease on his arrival

With respect to the nature of malaria varied have been the speculations. Lucretius, and subsequently Linnæus, supposed it to have an animalcular origin. To this view of the case I shall presently more particularly refer. The chemical philosophers, among whom was the celebrated Ramazzani, thought that malaria consisted in sulphureous and saline vapours. The mechanical philosophers, at the head of whom is placed Hoffman, attributed it to a diminished state of the elasticity of the air. Other chemists have considered malaria to be a peculiar gas. The following gases have at different periods been supposed to be identical with malaria :—carbonic, azote, hydro-carburetted, hydro-phosphuretted, hydro-sulphuretted. Many believe malaria to be carburetted hydrogen gas. This gas is highly destructive in its effect upon animal life. It is supposed to be generated at the bottom of stagnant waters, and may be collected by inserting a bottle of water over the pool, and stirring up the mud at the bottom to disengage the gas. Others have supposed malaria to be sulphuretted hydrogen gas. Air impregnated with 15,000 parts of this gas kills birds in a short space of time. We have no proof, however, that malaria consists of any one of the previously named gases. In order to establish that point, it will be necessary to demonstrate that the accused gas or gases give rise in the animal economy to the same phenomena that malaria does, viz., intermittent and remittent fevers. But they produce no such effect.

The air collected at the *embouchure* of the Valtelline, a country where it is impossible to sleep without being attacked with fever, gives the same constituent elements and proportions of the atmosphere as that collected at the summit of the Alps, or in the narrowest street in London. Morcati has condensed the exhalations of the marsh as they arose by means of glass globes filled with ice ; but these exhalations have not led to any discovery, nor in the least degree elucidated the subject. Chemists have found that on collecting light carburetted hydrogen gas from stagnant pools, and then passing it through water, a putrescible matter was left in the water, which decomposed very rapidly.

Volta, being on Lago Maggiore, stirred, by chance, the bottom of the lake with a stick, when he observed a disengagement of air bubbles from the mud, and that those parts disengaged the greatest number which were richest in decayed vegetable matter. He collected the gases, and found them to consist of carbonic acid, azote, oxygen, and carburetted hydrogen.

The atmosphere in the neighbourhood of some very insalubrious rice-fields has been examined by Morcati. He found that it contained albuminous flocculi, somewhat viscid in appearance, but the nature of which was not understood. The air in the vicinity of marshes appears to be heavier than the atmosphere of other places. It does not rise in the atmosphere unless mingled with it by currents of air. The same phenomena

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at Florence. It was of a very violent character. His wife was also attacked two days after. Another English family slept at Boccano on the same night as Dr Slaney, two of the servants belonging to which were attacked, one of whom died.

were noticed to characterise the air during the prevalence of cholera in London.

M. Julia, who has devoted much labour to the investigation of this subject, and who has examined with great attention the constitution of the atmosphere of those places where malaria is found, has come to the following conclusions :—1. That the air of these several situations contains the same principles, and in the same proportions, as the purest air of the most healthy localities. 2. Marsh air contains a principle which eludes the test of the most delicate chemical re-agents. 3. Though the nature of the noxious vapour is unknown, there is reason to believe that its pernicious effects depend upon a form of vegetable and animal substance in a state of decay, or on a solution of these substances in the air, or on gases resulting from their decomposition. 4. Experiment has not yet demonstrated in marsh air the existence of azotic gas, carburetted hydrogen, or ammoniacal gas, or any of the gaseous products of decomposition ; and if they are present in their vapour, their quantity is too small to be appreciated.

When a sewer becomes obstructed, and much filth is allowed to accumulate, malaria is formed. The exhalations are principally ammonia, sulphuretted hydrogen, and carburetted hydrogen gases. If a combination of these destructive gases be inhaled, great weakness and insensibility are induced, which often terminate in sudden death. But if these noxious effluvia be diluted with a considerable portion of atmospheric air, and then breathed into the lungs, their effects are not so apparent. M. Hallé has, in his "*Recherches sur la Natur du Mephitisme des posses d'aisance*, 1785," detailed many cases of serious epidemic diseases which were caused by such impure exhalations. Great care should be taken in clearing out drains. Before workmen are allowed to venture into such places it should be ascertained whether sulphuretted hydrogen gas be present. A piece of paper should be lowered into the drain, moistened with a solution of subacetate of lead, or rubbed with the dry carbonate of lead. If the above-named destructive gas be present, the paper will be stained a deep brown. In 1818 a serious epidemic disease broke out in a school at Clapham, which was clearly traced to the exhalations from a foul drain in the neighbourhood of the house. M. Jadioux remarked, that during the prevalence of typhus fever at Paris in 1814, the mortality was greatest in those wards nearest the sewers.

Chemical philosophers have in vain attempted to account for the difference in the effects of various conditions of the atmosphere. They have no test by which they are enabled to predicate the healthiness or unhealthiness of any particular air. The atmosphere over the most pestiferous marshes is as pure when subjected to chemical analysis as that is which is found in the vicinity of the most lofty mountains.

According to the experiments of Dalton, in a given volume of atmospheric air, taken at the surface of the earth, and assumed as unity, the weight of the azote is 0·7555 ; of the oxygen, 0·23332 ; the aqueous vapour, 0·0103 ; the carbonic acid gas, 0·001. He concludes that the proportion of aqueous vapour is variable in different places ; it is probable also, he says, that hydrogen is present in the atmosphere, but in too small a proportion to be detected by any experiment we are acquainted with. Mr Cavendish is the first who endeavoured to establish that the proportions of the two principal elements of the atmosphere were the same, notwithstanding the distance of places or the difference of temperatures. The observations since made by M. de Mairy, of Spain, M. Berthollet in Egypt and in France, and Sir H. Davy and Dr Beddoes in England, on the air brought from the coast of Guinea, seem to have confirmed this grand result. Gay-Lussac having elevated himself in a balloon to the height of 600 metres, the greatest extent ever attained by any person, brought some atmospheric air from these regions. This air, being analysed, gave out the same principles in the same proportions as air on the surface of the earth. The air of the surface of the earth analysed at different days, at various hours and temperatures, presents no change in its chemical composition. It invariably contains 0·21 of oxygen in volume, 10·783 of azote, 0·003 of hydrogen, and 0·004 of carbonic acid. Biot and Arrago have also verified this result. The air of deep valleys, high mountains, on banks of lakes, and in the glaciers of Chamouny, always presents the same constituent elements.

Dr Fletcher has advanced a novel and ingenious theory on this subject. He considers malaria not an exhalation from animal or vegetable matter in a state of decomposition, but the result of a secretion from the living vegetable in a state of disease consequent upon the locality in which it grows. Reasoning analogically, he observes, many diseases are communicated by a vitiated secretion, such, for instance, as small-pox, measles, &c.; a diseased vegetable secretion might give rise to malarious fevers. He considered that the clearing of a country was beneficial to the inhabitants, owing to the source of the disease in the vegetable being removed. If this be a correct theory, malaria ought to be most prevalent in places where there existed the largest quantity of vegetables; but this was not the fact. Malarious exhalations often emanate from stagnant pools in which there was no living vegetable.

It has been supposed that epidemic diseases are caused by minute animalculæ existing in the atmosphere under particular circumstances, and capable, by application to the living membranes and other parts, of acting as a virus on the human body. This speculation dates as far back as Lucretius. The diffusion of contagion has a close analogy with fermentation, and Cagnard, Latour, and Schwaun have shown that fermentation is the decomposition of organic fluids by minute vegetables of the lowest class. Putrefaction is a destruction of organic matter effected by infusoria, and not a mere decomposition into elements. One contagious disease, it is said, the muscardine of the silk-worm, is known to depend upon the development of a vegetable parasite. The germs are innumerable, and spread with the greatest rapidity. Of the condition of atmospherical life little has been known until of late. The miscroscope has disclosed to us some idea of the vast domain of life to which the infusoria belong. An attempt has been made to trace many diseases that assume an epidemic character to an insect origin. Many facts tend to establish this view of the case. In many of the morbid secretions minute insects have been detected. In the pus expectorated by patients labouring under consumption, a minute worm (*polystoma sanguicola*) has been discovered. Mr Owen, who has paid much attention to the classification of human entozoa, supposes that cataract of the eye is produced by a minute insect. Scrofula is supposed to be caused by the minute ova of parasitic animals taken up by the absorbents, and deposited in particular textures of the body. The peculiar history of the cholera epidemic somewhat strengthens the presumption that it had an insect origin. This disease first appeared in the Delta of the Ganges, and within seventeen years spread itself round almost the circumference of the habitable globe. Hitherto no physical, chemical, or electrical condition of the atmosphere, has afforded a probable solution of the phenomena of the disease. The striking feature in this singular malady was the frequent suddenness of its appearance and disappearance in given localities. No gaseous, mineral, or vegetable matter diffused in the air could create so strange a disorder. Occasionally it appeared to travel slowly, then again it would suddenly develop itself at a considerable distance from the place where it was supposed to have originated. No conditions of the earth's atmosphere on human habits will satisfactorily explain the cause of this migratory disease. On this subject Dr Holland says—"The sudden appearance and rapid multiplication of insect swarms at certain times, and in situations favourable to their propagation, are facts familiar to naturalists. The diffusion of such swarms, sometimes by continuous flight for great distances, sometimes by tardy, broken, and divided progress, is equally familiar to observation, however scanty our knowledge of the animal instincts by which these movements are governed. The same analogy extends to the disappearance of these swarms, either suddenly, by further flight, or atmospheric changes on the spot, or more gradually, by completion of their term of existence, want of food, or any physical causes tending to destroy their ova, or retard their development and the successive metamorphoses they undergo."

In many respects, indeed, the erratic and ambiguous course of the cholera is well represented by the flight, settlement, and propagation of the insect swarms, which inflict blight upon vegetable life. Their appearance at different and distant periods, without obvious cause for such irregularity,—their direction to certain plants only,—their settlement upon these in clusters and detached localities,—the frequent suddenness of their change of place and final disappearance,—are all circumstances of curious analogy; as also the curiously abrupt limitation of some of these swarms, showing itself in definite lines of direction, along which their work of destruction is carried on. These lines, though to our observation seemingly arbitrary, are doubtless connected with the instincts of life under this form, and with relation of such instincts to the surrounding media. The cholera has been often defined in its course by similar lines of direction; sometimes stretching over considerable tracts of land or sea, more frequently obvious in particular localities; but in neither case receiving explanation from any physical conditions of the globe, from currents of air, or local circumstances of soil and climate. The cholera often spread itself in the face of a prevailing wind, where no obvious communication was present;—a circumstance difficult, if indeed possible, to be explained, with reference to animal life, as the cause of the phenomenon. No mere organic matter could be so transferred, nor is vegetable life better provided with the means of overcoming this obstacle.

It has been supposed by many that the development of malaria is more dependent upon the electrical condition of the atmosphere than upon any physical state of the soil from which the poison is said to proceed. This view of the question is supported by numerous facts. The evidence is not, however, sufficiently strong to warrant us in coming to any positive conclusions on the subject. As the chemical philosopher has vainly endeavoured to detect any essential difference between the air in the immediate neighbourhood of marshes where a pestilential poison is known to be generated in large quantities and the air of places remarkable for its purity, the electrician has stepped forward for the purpose of demonstrating the existence of a peculiar electrical state of the atmosphere under these circumstances. There certainly appears to be a strange relationship, not altogether of an accidental character, between the prevalence of epidemic diseases and certain electrical phenomena. It is well known that intermittent fever is often developed, and assumes an epidemic form, among sailors who have been exposed to a thunder-storm. Eruptions of Mount Vesuvius and Ætna have been accompanied by severe epidemic diseases in the vicinity. An attempt has been made to trace a connexion between the appearance of comets and the prevalence of pestilential affections. In 15 (A.D.) a comet was seen at Rome, and a pestilence raged in Asia. In 40 another was visible, and earthquakes were frequent, and Rome was afflicted with the plague. In 67, during the reign of Nero, a large comet appeared, and a pestilence carried off 30,000 persons. Tacitus states that the houses were full of dead bodies. Simultaneously with the plague of London a large flaming comet was perceptible. Since the Christian era 500 comets have appeared, and only 100 previously. It is an established fact, that the most unhealthy periods have been those in which large comets have been visible.

As an exposure to malaria gives rise to a variety of essentially different affections, it has been a question with medical men whether it consists of one or many kinds. We have no satisfactory evidence to establish the fact that there is a plurality of malarious poisons. Many circumstances no doubt act in modifying the nature or properties of malaria. Chemical analysis has detected as numerous and striking differences in the elementary constitution of plants as there are in their actions on the living animal body. It may not be irrational to conclude that the nature of the poison which the decomposition of vegetable products originates, may be regulated by the original chemical constitution of the plant producing it. Again, the decomposition of narcotic plants may possibly assist in modifying the qualities of malaria. The effect, however, of marsh-miasmata must be greatly dependent on the constitution and susceptibilities of the person exposed to its influence.

The most important branch of this subject relates to the most effectual mode of correcting the bad qualities of marshy soils where malaria is generated, and if this cannot be accomplished, to discover how the inhabitants of these districts can best be protected from those affections which malaria is known to give rise to. All swampy districts should be drained, and if this is impracticable, owing to the low situation of the land, they should be emerged. Beecher has related several cases in which this plan was successfully adopted; where marshes are laid deeply under water, he considers that the great quantity of fluid opposes the decomposition of animal and vegetable substances, and the air, consequently, preserves its purity.

Empedocles is said to have delivered the Salantini from the dangerous exhalations to which they were subjected by conducting into their marshes the neighbouring rivers, which cleaned them of their stagnant water, and malaria was no longer generated, and the affections which the impure air gave rise to also ceased. Rivers should be prevented from overflowing by erecting proper embankments. Everything should be done to preserve the cleanliness, and to promote the ventilation and dryness, of towns and villages. The draining of an unhealthy district should not be performed until the end of autumn, in winter, or the beginning of spring. Persons employed in such avocations should be well clothed, and have proper nourishment. A small allowance of fermented liquor and spirits is often serviceable in preserving the body from the noxious influence of malaria. A small piece of gauze over the face will often be of service under such circumstances. It has been clearly established that the two or three years which immediately succeed the draining of marshes are considerably more unhealthy than the preceding ones.

Various instructions have been laid down for protection of those who are compelled to reside in infected districts. It has been found that if the houses are kept warm and dry, and those who are exposed to malaria live well and keep themselves clothed in wool, its pernicious influence is considerably diminished. If persons are obliged to pass the night in malaria districts, the air ought to be kept dry by fires.

The most dangerous occupations in warm climates are cutting wood, cultivating land, sailing in open boats in the neighbourhood of marshy or foggy districts, and passing the night in wet situations without shelter.

Dr Lind has observed, that where any extensive undertaking is to be accomplished in unhealthy districts, it should be entrusted to those who are accustomed to the climate. It has been found that those who have been habituated to the air of marsh-miasmata are less subject than others to intermittent fevers. The countrymen who come down in the harvest time into the Campagna, Modena, Ferrara, Bresse, &c., where the rice grounds and marshy districts are principally situated, are attacked with the fever, even when the season is considered favourable to the natives.

During the journey of M. Ozanam through one of the most unhealthy situations in the middle of the Pontine Marshes, viz., *Torre de tre Ponti*, he was much surprised to see the *maître de poste* of that place with every appearance of the enjoyment of the most perfect health. He asked him how he managed to look so well living as he did in so pestilential a locality. "It is more than forty years since I have inhabited this place, and I have never had the fever; the only precaution which I take is to come out of my house when the sun is setting, and to have a fire lighted. I nurse myself well; I drink wine, and in this consists my good health."

It would appear from the writings of Hippocrates, Livy, Tacitus, Plutarch, and Dionysius of Helicarnassus, that the insalubrity of thick woods, jungles, argillaceous soils, the embouchures of rivers, particularly if exposed to the influence of an elevated temperature, was familiar to them. It is stated by Hippocrates in his 'Epidemics,' that the city of Abydos had been several times depopulated by fever; but the adjoining marshes having been drained on his recommendation, the place became healthy.

M. Julia states, that he has seen nine persons employed in cutting down the vegetables in the great ditch of the marsh of Cercle, all of whom were attacked some days afterwards with intermittent fever; one of these, a female, died, and the other eight laboured under the fever and ague for some length of time.

Fire and tobacco-smoke appear to diminish the deleterious effect of malaria. At one period it was supposed that the smoke of coal was particularly injurious, and it was made a capital offence to burn coal in London, and forges were only allowed in the vicinity. In the Tower there is a document relating to a person who was executed in the time of Edward the First for burning coal in London. When Napoleon was in Italy with his army, he was in the habit of employing fires to a great extent to keep away the malaria, and he did so with great success. Dr Ford mentions, that when the 'Edgar' ship of war was off the coast of Guinea in 1765, the crew were very sickly, and many of them died from fevers; but in the crew of a sloop of war, which always accompanied her, very few were ill, and none died. In the latter there was a fire for cooking on the same deck where the men lay, and which filled with smoke the spot where they slept; whereas in the 'Edgar,' from the particular arrangement of the vessel, there was no smoke whatever between the decks.

The ancients appear to have known the effect of trees in intercepting the progress of malaria. They surrounded their temples with groves on account of their protecting influence. Pope Bennoit XIV ordered a wood to be cut down which separated Villatri from the Pontine Marshes, and in consequence, for many following years, there raged throughout the whole country, and in places never before attacked, a most severe and fatal fever. The same effects were produced from a similar circumstance in the environs of Campo Salino. Lancisi states, that a forest, which extended from the heights of Frascati and of Albano almost to the Tiber, having been felled, this barrier between the Pontine Marshes and the southern parts of Rome being removed, the Campagna di Roma became uninhabitable. In the West Indies it is quite wonderful how near to the leeward of the most pestiferous marshes the planter, provided he is protected by trees, will venture, and that with safety, to place his habitation. Near St Stephano, on Mount Argentel, a convent is situated which was used for the salubrity of its air; but since the forests which surrounded it have been cleared it has become unhealthy.

There are several districts in which agues prevailed to a great extent, but where they are now perfectly unknown, owing to the beneficial effects of draining. In Portsmouth, which is built upon part of the marshy island of Portsea, intermittent fevers were very prevalent previously to that town being drained and paved in the year 1769.

Professor Fodéré advises that strict attention should be paid to the thorough ventilation of inhabited districts. He observes, there are several towns which were formerly subject to epidemics, but have become healthy since they have been dismantled of their useless ramparts, and by this means have been exposed to every wind.

Mr Humboldt speaks of a town of South America which, owing to the removal of a rampart and the levelling of a rock, which sheltered it from the north winds, has been less subject to yellow fever.

The jungle fever, as it is termed, is partly occasioned by the interruption of the free circulation of the air by the woods or jungles, which confine the exhalations, and by this means become the fruitful *foyers* of disease. In India the proximity to the jungles exerts a great influence over the health of those who reside not only on the plains, but on the hills, and take no slight part in the production of the endemic diseases peculiar to that country.

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CHAPTER IV.

ON LONGEVITY.

The truth of the Hippocratic axiom, that "life is short," is universally admitted. The beginning of existence is but the commencement of decay. Simultaneously with the first dawnings of vitality does the relentless hand of death fix his arrow in our hearts. Every organic action is but life struggling with impending dissolution. The processes of absorption and assimilation are striving for the mastery, and in proportion as one or other obtains the ascendancy do we approach that fatal hour when the silver chord of life is snapped asunder. Health consists in an harmonious action of all the organs, and is best preserved by maintaining an exact proportion between food and labour; or rather by keeping the mean supply, though somewhat irregular, equal to the mean consumption. The duration of life does not depend so much on the strength of the body, or upon the quantity of excitability which exists in the frame, as upon an accommodation of stimuli to each of the vital organs. A watch-spring will last as long as the chain of an anchor, provided the forces which are capable of destroying both are in exact ratio to their strength.

In the support of human life, nature operates by laws as simple and beautiful as those by which the world is governed. What a harmony is observed by the planets, and their satellites, in their revolution round the great source of heat and light,

> "—————— all combined
> And ruled unerring, by that single power
> Which draws the stone projected to the ground."

In proportion as the laws of nature are preserved, health is maintained and longevity promoted. Length of life appears to be a great desideratum with all living beings. From the earliest periods of the history of the world, the secret of longevity has been sought for with avidity. Life, even under circumstances the most revolting, and coupled with conditions the most painful and humiliating, has been eagerly sought after. That this should be the case need not be a matter of surprise. Longevity implies the existence of health of body and mind, and on these two conditions is based the happiness of the human race.

In alluding to the close relationship between happiness and longevity, Dr Smith eloquently observes, that "Enjoyment is not only the end of life, but it is the only condition of life which is compatible with a protracted term of existence. The happier a human being is, the longer he lives; the more he suffers, the sooner he dies: to add to his enjoyment is to lengthen life; to inflict pain is to shorten the duration of existence. As there is a point of wretchedness beyond which life is not desirable, so there is a point beyond which it is not maintainable. The man who has reached an advanced age cannot have been, upon the whole, an unhappy being; for the infirmity and suffering which embitter life cut it short. Every document by which the rate of mortality among large numbers of human beings can be correctly ascertained, contains within it irresistible evidence of this truth. In every country the average duration of life, whether for the whole people or for particular classes, is invariably in the direct ratio of their means of felicity; while, on the other hand, the number of years which large portions of the population survive beyond the adult age, may be taken as the certain test of the happiness of the community. How clear must have been the conception of this in the mind of the Jewish legislator when he made the promise, 'that thy days shall be long in the land which the Lord thy God giveth thee'—the sanction of every religious observance, and the motive to every moral duty."

In considering the subject of longevity, it is my intention to point out the principal causes that are supposed to operate in affecting the duration of life. These may be classified as follows:—1. Climate. 2. Air. 3. Food and drink. 4. Acquired habits. 5. Mental states. 6. Exercise. 7. Sleep. 8. Marriage. 9. Hereditary descent.

In various works relating to this subject, there are recorded a variety of most extraordinary instances of longevity, collected together with so little attention to their authenticity, that we are compelled to hesitate before we give them credence. So many wonderful cases of longevity are related that we should be justified in concluding, that to live to an advanced age is the rule, and the reverse but an exception. Lord Bacon, in his work on 'Life and Death,' details the history of many remarkable instances of longevity which occurred in Italy, based on calculations of the most fallacious character. He has founded his observations on the return made by the Emperor Vespasian, forgetting that the object of that census was to tax the people, who strove to make out cases of longevity, in order to avoid the assessment.*

Of Roman, Greek, French, and German Emperors and kings down to the reign of James I, in 200 princes, there were only four octogènarians. Among the apostles and the fathers of the church, cases of longevity were said to be very common, and this is attributed to the supposition that they breathed divine atmosphere, "Nihil spirans nisi divinum." Among the first 200 popes, only five lived to the age of eighty. The twenty-third pope, despite of his unquiet temperament, lived to the age of ninety.

But, notwithstanding, I am disposed to question the accuracy of many cases of longevity that are on record, there can be no doubt that a vast number of surprising instances of protracted life have occurred at different periods and places.

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* An order was issued by Kien Long, Emperor of China, in 1784, to assemble before him all the old men in his empire. Yet, through his extensive dominions, and out of the immense population of that country, four persons only could be found whose several ages exceeded 100 years!

In the 'Philosophical Transactions' the singular case of Henry Jenkins is recorded. This man died at the very advanced age of 169. A few years before his death he appeared in a court of justice, and gave evidence in a cause. The celebrated case of Thomas Parr, of Wennington, Shropshire, is also detailed in the same publication. He died in the year 1638, at the age of 152. Dr Harvey, who opened the body after death, states that he found it to be in a most perfect state. His death was caused by plethora, brought on by more luxurious living in London than he had been accustomed to in his native country, where his food was very plain and homely. Parr lived during the reigns of ten kings and queens, and was buried in Westminster Abbey. He married a widow after he was 120 years of age. He is said to have been a man of a very different stamina from mankind in general, for a person who had seen him, described him thus:—

> " From head to heel his body had all over
> A quick-set, thick-set, nat'ral hairy cover."

When he was 151 years of age he was brought to London by Thomas Earl of Arundel, and carried to court. The king said to him, " You have lived longer than other men, what have you done more than other men ?" Parr replied, " I did penance when I was 100 years old." His chief rules for longevity were well known :—" Keep your head cool by temperance ; your feet warm by exercise ; rise early and go soon to bed ; and if you are inclined to get fat, keep your eyes open and your mouth shut ;" or, in other words, " be moderate both in your sleep and diet."

Maffeus, a Portuguese author, who wrote a history of the East Indies, mentions a man of the name of Numus de Cugna, a native of Bengal, who died in the year 1566, at the almost incredible age of *three hundred and seventy years !*

Maffeus represents him to have been a person of great simplicity, and quite illiterate ; but of so retentive a memory, that he was a kind of living chronicle, relating, distinctly and exactly, what had happened within his knowledge in the compass of his very long life, together with all the circumstances attending it. He had four new sets of teeth ; and the colour of his hair and beard had very frequently changed from black to grey, and from grey to black. He asserted that, in the course of his life, he had seven hundred wives, some of whom had died, and others he had put away. The first century of his life was passed in idolatry, from which he was converted to Mahometanism, which he continued to profess until his death.

J. Jacobs, a peasant on the estate of the Prince de Beautremont, lived to the age of 120. He travelled at that age from the Jura mountains to Versailles, to thank the National Assembly for having released him from the feudal yoke. " Libertas, quæ sera, tamen respexit." He was received by all the members standing and uncovered, was allowed a chair, and to sit with his hat on. A collection was made for him among the members, which amounted to 500*l.*[*]

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[*] Smellie has laid down as an axiom that animals that acquire maturity in a short space of time, are shorter lived than those which are longer in arriving at that period. A bear rarely exceeds twenty years ; a dog lives twenty years ; a wolf twenty ; a fox fourteen or sixteen ; lions are long-lived—Pompey lived to the age of seventy. The average age of cats is fifteen years ; a squirrel and hare seven or eight years ; rabbits seven. Elephants have been known to live to the great age of 400 years.

The tables of longevity, published for the year 1817, in the Russian empire, give the following results :—Amongst 828,561 persons who died, all belonging to the Greek church, there appears to have been as follows :—

1	above	140	Years of Age.
1	„	135	„
7	„	130	„
21	„	125	„
51	„	120	„
83	„	115	„
783	„	100	„

On the subject of longevity and mortality in Prussia, Dr Hoffman states ('Medicinische Zeitung, No. IV, 1839), that during the eighteen years, commencing 1st of January, 1820, and ending 31st of December, 1837, the mortality in 12,626,379, being the average population of Prussia during that period, amounted to 6,653,167 ; of this number, 149,058 attained the age of from eighty to eighty-five years ; 67,754 that of from eighty-five to ninety years ; and 31,516 attained the age beyond ninety. Thus 248,328 individuals, or 3·732 per cent. of the population, attained an age beyond eighty.

M. de la Malle has constructed a table showing the probabilities of human life at different ages among the Romans. The following is a transcript of it :—

Age.	Probable Future Life.
From 0 to 20	30 Years.
„ 20 „ 25	28 „
„ 25 „ 30	25 „
„ 30 „ 35	22 „
„ 35 „ 40	20 „
„ 40 „ 45	18 „
„ 50 „ 55	13 „
„ 55 „ 60	7 „
„ 60 „ 65	5 „

Thirty years was the mean duration of life among the Roman citizens, during the time of Servius Tullius to that of Justinian. Since that

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When Alexander the Great had conquered one Phorus, King of India, he took a great elephant, which had fought very valiantly for the king, and named him Ajax, and dedicated him to the sun, and let him go with this inscription—" Alexander, the son of Jupiter, hath dedicated Ajax to the sun." This elephant was found with this inscription 350 years after. (Vide 'History of Brutes,' by W. Franguis, D.D.). Pigs have been known to live to the age of thirty years ; the rhinoceros to twenty. A horse has been known to live to the age of sixty-two, but averages twenty-five to thirty. Camels sometimes live to the age of 100. Stags are long-lived. Sheep seldom exceed the age of ten. Cows live about fifteen years. Cuvier considers it probable that whales sometimes live to the age of 1,000 years. The dolphin and porpoise attain the age of thirty. An eagle died at Vienna at the age of 104 years. Ravens frequently reached the age of 100. Swans have been known to live 300 years. Mr Mallerton has the skeleton of a swan that attained the age period the probabilities of human life have increased twenty years. The mean term of life in England is computed at fifty years; in Paris forty-two; in Florence thirty; in America forty-five.

It is not my intention to enter into a particular consideration of the influence of good air, or a proper regulation of diet, on health and longevity.* These are points that require a separate consideration: they are too important to be discussed cursorily. Pure air is as indispensable to health and long life as good food; and moderate exercise of the body is as conducive to happiness and longevity, as moral and intellectual exertion is favourable to mental vigour.

Equestrian exercise is very conducive to longevity. In Nimrod's "Hunting Lives," he says—"My time has been almost divided between my saddle and my bed. I never knew what it was to be fatigued when I lived temperately and went to bed early. Such a life bids defiance to disease." A celebrated physician of the last century used to recommend his patients to live on a saddle. Who ever heard of a bilious *post-boy?*

Judicious exercise of the lungs is one of the most efficacious means which we can employ for promoting their development and warding off their diseases. In this respect the organs of respiration closely resemble the muscles and all other organized parts. They are made to be used, and if they are left in habitual inactivity, the health becomes impaired. Dr Combe recommends singing, speaking aloud, &c. Dr Huffeland, when speaking of the good effects of exercise of the lungs on the healthy condition, facetiously observes, that the superior longevity of women is dependent on their being more loquacious than men.

Kitchener observes—"Whether rising early lengthens life we know not, but are sure that sitting up late shortens it. I recommend you to rise by eight, and retire to rest by eleven. One hour's rest before midnight is worth two after."

Jeremy Taylor says that only three hours out of the twenty-four should be devoted to sleep; Baxter fixes on four, Wesley on six, and Lord Coke on seven. Sir G. Blane was informed by General Pichegru that, in the course of his active campaigns, he had, for a whole year, slept on an average but one hour out of the twenty-four. Frederick the Great and Napoleon passed, during the active periods of their career, a surprisingly short period in sleep.

It was at one time supposed that painting the body would conduce to longevity, from the fact that the ancient Britons, and Indians of Virginia, who were long-lived, painted theirs. The Irish, it has been said, "though they lived naked in the woods, were long-lived, by means of their almost frying and baking themselves before the fire whilst they rubbed in or anointed themselves with quantities of salt butter." When Joannes de Temporibus, who is said to have lived three hundred years, was asked how he prolonged his life, he replied, "By oil without and honey within." On the contrary, when a Roman judge, struck by the health of a witness a

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of 200 years. Pelicans are long-lived. A tortoise has been known to live to the age of 107.

* Longevity is frequent among the different orders of religion who, by their statutes, are confined to a moderate diet, and are obliged to abstain from wine and the use of meat. Some celebrated anchorites have lived to a great age, while they fed upon nothing but the wild roots and fruits which they found in the deserts where they lived. The philosopher Xenophilus, who lived to the age of 106, belonged to the Pythagorean sect.

hundred years old, put to him the same question, he answered, "By eating before I was hungry, and drinking before I was dry."

Cold climates appear to be favourable to longevity. In Norway, of 6,927 who were buried in 1761, 63 had lived to the age of 100; and in Russia, out of 726,278 souls who died in 1801, 216 were 100 years of age, and 220 above it, of whom 4 are said to have been above 130 years old. In the diocese of Agghcrus, in Norway, there existed, in the year 1763, 150 couples who had lived together upwards of 80 years. Excessive cold, however, is prejudicial to long life. In Iceland and Siberia men attain at the utmost to the ages only of 60 or 70.

Temperate climates are, however, most conducive to health and long life. There the human frame is more complete, the body more vigorous, the mind the best formed, the passions the best regulated; and man in every respect reaches, when well governed, the highest amount of perfection. The districts of Arcadia, Ætolia, and other parts of Greece, were celebrated for longevity. More old men are to be found in mountainous and elevated situations, than in plains and low countries.

Of the influence of cold on the duration of life I have spoken in a previous essay. It is established that, during the coldest months, there is regularly the greatest number of deaths amongst those above sixty years of age. Dr W. Heberden, in his work on 'The Climate and Diseases of London,' observes, that one of the first things that must strike every mind engaged in the investigation of human health, is the effect of a severe frost on old people. He says, "It is curious to observe, among those who are said in the bills of mortality to die above 60 years of age, how regularly the tide of mortality follows the influence of this prevailing cause; so that a person used to such inquiries, may form no contemptible judgment of the severity of any of our winters, merely by attending to this circumstance." This observation is confirmed by that accurate observer and able physician, Dr Beddoes, who remarks, that "During the coldest months there is regularly the greatest number of deaths among those aged above 50, and the fewest in the middle of summer."

Both the Peruvian Indians and the Creoles are remarkably long-lived, and retain their vigour and bodily faculties to a very advanced age. In the small province of Caramarco, containing hardly 70,000 inhabitants, there were eight persons alive, in 1792, whose ages were 114, 117, 121, 131, 132, 135, 141, and 147; and in the same province, a Spaniard died in 1765, aged 144 years, 7 months, and 5 days, leaving 800 persons lineally descended from him ('Mercurio Peruano.') Humboldt, when he was at Lima, saw a Peruvian Indian who died at the age of 147, having been married for 90 years to the same woman, who had lived to the age of 117. Until he attained to the age of 130, this venerable personage used to walk three or four leagues every day; but for the last twelve months of his life he had lost his sight.*

Various explanations have been given of the causes of the longevity of the antediluvians. It has been attributed to the sobriety of their habits, and the simplicity of their manners; others have ascribed their longevity to the excellency of their fruits, and some peculiar virtue in the herbs used in those days. Again, others have ascribed their long lives to the salubrity of the antediluvian air. From the longevity of those who lived before the deluge, Dr Derham has deduced a good argument in favour of the interposition of Divine Providence. Immediately after the Creation, when the world was to be peopled by one man and woman, the ordinary age was 1,000 years and upwards. Immediately after the Flood, when there were three persons to stock the world, their age was cut shorter; and none of those patriarchs but Shem arrived at the age of 500. In the second century none reached the age of 240; in the third none but Terah lived to the age of 200. As population increased, persons became short-lived until the time of Moses, when the ordinary age was 70 or 80.

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* Humboldt, 'Essai Politique sur la Nouvelle Espagne.'

Like disease, the principle of longevity is transmitted from one generation to another. Healthy parents will have healthy children, and descent from long-lived ancestors gives the greatest probability of attaining to old age. Out of 598 individuals who were above 80 years of age, 303 affirmed that they were descended from long-lived ancestors; the remaining 295 either would give no account of their ancestors, or declared that there was nothing remarkable with regard to their longevity. Dr Jameson observes, that most of the great ages recorded on monumental stones in the churchyards of Cheltenham, and the neighbouring villages of Gloucestershire, run in particular families. Dr Rush also states that he never knew a single instance of a person who lived to be 80 who had not descended from long-lived ancestors. In many cases, the descent was not only from one, but both parents; this was the case with regard to Dr Franklin, who died at the age of 84: his father died at 89, and his mother at 87. His father had 17 children by two wives. It is stated that that eminent philosopher once sat down as one of eleven adult sons and daughters at his father's table.

The following table, constructed by M. Lombard, *Médecin de l'Hôpital Civil et Militaire de Genève*, is taken from his work, 'De l'Influence des Professions sur la Durée de la Vie,' and presents the mean age, at death, of 6,338 males, distributed in 42 different professions:—

No. of Deaths.	Profession.	Average Age.	No. of Deaths.	Profession.	Average Age.
71	Magistrates	69·1	63	Farriers, Blacksmiths	54·5
275	Persons with a fixed income	65·8	41	Printers	54·3
52	Protestant Clergymen	63·8	376	Shoemakers	54·2
80	Retired Officers	63·6	247	Tailors	54·2
476	Merchants	62·0	97	Coopers	54·2
67	Clerks in Public Offices	61.9	41	Surgeons, Apothecaries	54·0
152	Goldsmiths	61·6	77	Butchers	53·0
41	Weavers	60·5	171	Day Labourers	52·4
202	Gardeners	60·1	48	Porters	52·3
47	Founders	59·4	370	Watch-box Makers	52·2
40	Criers, &c.	59·1	125	Calico printers	52·1
152	Different Tradesmen	59·0	78	Carriers	51·4
99	Woodcutters	58·8	46	Writers Writing-masters	51·0
94	Hairdressers	57·5	82	Bakers	49·8
120	Tavern-keepers	56·3	143	Joiners and Cabinet-makers	49·7
1073	Watchmakers	55·3	138	Jewellers	49·6
124	Masons	55·2	46	Boatmen	49·2
43	Tanners	55·2	75	Enamellers	48·7
176	Carpenters	55·1	62	Locksmiths	47·2
117	Spring makers	54·8	65	Painters and Varnishers	44·3
267	Agriculturists	54·7			
179	Engravers	54·7			

It is the generally received opinion that persons who mix much in the turmoils of political contests, are short-lived. Perhaps, *à priori*, reasoning would justify such a conclusion.

It is true that we can hardly imagine a situation in life which so powerfully calls into exercise all those mental emotions which are generally considered, when unnaturally excited, to injure the health, and therefore shorten the duration of existence, as that occupied by the zealous politician, who embarks his all—

> "Upon those stormy seas,
> Bankrupt of life and prodigal of ease;"

but facts stand in opposition to theory. Most of our celebrated politicians have been anything but short-lived. Judging from the advanced age which many have attained, I should feel disposed to infer that the mental excitement to which this class is almost constantly exposed, tended rather to prolong than to shorten life. That sudden vicissitudes of fortune, ruined hopes, blighted ambition, must occasionally produce the most disastrous consequences to the health, no one will deny. In order to establish the truth of the proposition, that the politician is not short-lived, I have selected the names of the most prominent men who have figured in the arena of politics for the last fifty years, by which it will be seen that the majority of them—men who were constantly mixed up with party strife—lived to a respectable old age. The following table shows the ages, with a few exceptions, of the prime ministers of this country, from 1754 to 1827 :

Years.	Name.	Age.	Years.	Name.	Age.
1754	Duke of Newcastle	82	1783	W. Pitt (E. of Chatham)	70
1762	Earl of Bute	79	1801	H. Addington (now Visc. Sidmouth, alive)	
1763	Geo. Grenville	58			
1765	Marquis of Rockingham	52	1804	W. Pitt	47
1766	Duke of Grafton	74	1806	Lord Grenville	75
1770	Lord North	63	1807	Duke of Portland	—
1782	Marquis of Rockingham	—	1810	Spen. Percival (assass.)	
1782	Earl of Shelburne	68	1812	Earl of Liverpool	58
1783	Duke of Portland	71	1827	Geo. Canning	57

The succeeding tables of the ages of the most prominent political characters of this and other countries of the last half century, corroborate the statement previously made :—

Names.	Ages.	Names.	Ages.
PEERS.		COMMONERS.	
Harley, Earl of Oxford	63	John Wilks	76
Walpole, Earl of Orford	69	Sir P. Francis	78
Viscount Bolingbroke	79	E. Burke	67
Pulteney, Earl of Bath	82	C. J. Fox	57
Lord Chesterfield	75	Grattan	70
		R. B. Sheridan	65
		Sir W. Wyndham	53

FOREIGN STATESMEN.

Name.	Age.	Name.	Age.
Ximines (Cardinal)	81	Cardinal Alberoni	88
Leo the Tenth	46	Oxerstiern	71
Sully	81	Cardinal Dubois	67
Duke of Lerma	47	Cardinal de Fleury	90
Cardinal de Richelieu	57	Count Zinzendorf	71
Cardinal Mazarin	59	Pombal	83
Cardinal de Retz	65	Duke de Choiseul	76
Colbert	64	Necker	72

If reference be made to the most celebrated living members of the British peerage, it will be seen that the active political life which the majority of them have led, has not had the effect so erroneously attributed to this kind of mental excitement. The truth will be demonstrated by the following tabular statement:—*

Names.	Ages.	Names.	Ages.
Duke of Buckingham	44	Lord Wharncliffe	64
—— Wellington	71	—— Wynford	73
Earl Grey	76	—— Manners	84
—— Harrowby	78	—— Ellenborough	50
—— Abergavenny	86	—— Dunfermline	64
—— Carlisle	67	—— Carbery	75
—— Harewood	73	—— Marquis of Anglesey	72
—— Haddington	60	—— Wellesley	80
Lord Lyndhurst	68	—— Lansdowne	60
—— Bexley	74	Viscount Sidmouth	83
—— Abinger	73	——— Melbourne	61
—— Brougham	61	——— Canterbury	61
—— Plunket	76	——— Melville	69

It is a fallacy to suppose that the duration of life is shortened by literary pursuits. The great philosophers of antiquity—men whose minds were ardently engaged in the acquirement of knowledge and the pursuit of truth, were long-lived. The German literati, who devote themselves from a very early period to abstruse speculations, are remarkable for their longevity. Blumenbach, the distinguished physician and naturalist, states, that for the long period (exceeding half a century) he was associated with the most celebrated European universities, he did not witness a solitary example of any youth falling a victim to his ardour in the pursuit of intellectual distinction; and Eichhorn, one of the most voluminous writers of the day, the eminent philologist and historian, is said boldly to affirm "That no one ever died of hard study. The idea is preposterous. A man may fret himself to death over his books, or anywhere else, but literary application would tend to diffuse cheerfulness, and rather prolong than shorten the life of an infirm man." Dr Madden affirms that the exercise of the imaginative faculty is more likely to injure the health and shorten life, than the exercise of the reasoning and judging power of the mind. He lays down the axiom, "That the vigour of a great intellect is favourable to longevity in every literary pursuit, where the imagination is seldom called upon." The following table of the order of longevity, showing the average duration of life of the most eminent in each literary pursuit, is taken from Dr Madden's 'Infirmities of Genius :—'

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* In order to obtain accuracy in my statements, I have referred to '*The Parliamentary Companion*,' and a work entitled '*The Peerage, Baronetage, and Knightage of Great Britain and Ireland*,' edited by C. R. Dodd, Esq. Both of the above-mentioned publications should be in every gentleman's library; they are compiled with great care, and contain a mass of information.

Profession.	Number.	Average Age.	Profession.	Number.	Average Age.
Natural Philosophers	1494	75	Philologists -	1323	66
Moral Philosophers	1417	70	Musical Composers	1284	64
Sculptors and Painters - -	1412	69	Novelists, and Miscellaneous Authors	1257	62½
Authors on Law and Jurisprudence	1399	68	Dramatists -	1244	62
Medical Authors	1368	68	Authors on Natural Religion -	1245	62
Authors on Revealed Religion -	1350	67	Poets - -	1144	57

A writer in the 'Quarterly Review' attributes the longevity of literary men to the circumstance of the works upon which their reputation is based, being the productions of their mature years. This may be true with reference to a few, but not of the majority of the literati. This fact does not, however, militate against the principle, that exercise of the intellect conduces to health and long life.

It would appear from the following table that eminent literary ladies are long-lived :—

Names.	Ages.	Names.	Ages.
Lady Russell - - -	87	Mrs Chapone - - -	75
Mrs Rowe - - -	63	— Lennox - - -	84
Lady M. W. Montague -	73	— Trimmer - - -	69
Mrs Centlivre - - -	44	— Hamilton - - -	65
Lady Hervey - - -	70	— Radcliffe - - -	60
—— Suffolk - - -	79	— Barbauld - - -	83
Mrs Sheridan - - -	47	— Delany - - -	93
— Cowley - - -	66	— Inchbald - - -	68
— Macaulay - - -	53	— Piozzi - - -	80
— Montague - - -	81	— H. More - - -	88

From the great age to which many eminent musicians have lived, an inference may be drawn in favour of that captivating science as conducive to health and long life.

Dr Child died aged	90	Dr Hasse died aged	86
Turner „	88	Wagenseil „	96
Playford „	80	Bach „	80
Scarlatt „	87	Pepusch „	85
Porpora „	82	Leveridge „	88
Tartini „	80	Farinelli „	80
Geminiani „	96	Cervetto „	103
Rameau „	84		

I am not disposed to give a cordial acquiescence to the maxim, that persons possessing active poetical imaginations are short-lived. The table made out by Madden would perhaps warrant such an opinion, but he has omitted to mention the names of many poets who attained to an advanced age. Chaucer died at the age of 72; Göethe at 83; Klopstock, the Milton of Germany, lived to the age of 79. In estimating the influence of the poetic temperament on longevity, we must not omit to consider other circumstances, viz., the habits of life, which may have contributed mainly to premature decay and death. Burns died at 38, but his death must have been accelerated by intemperance. Cowley died at the age of 49; his death was caused by a fit of drunkenness; and yet these two cases are cited by Madden in confirmation of the opinion, that the exercise of the imagination shortens the duration of life!

Dr Caldwell, in his treatise on Physical Education, justly observes, that the influence of strong and well-cultivated moral and intellectual organs on the general health of the system is soothing and salutary, and feeds and strengthens it instead of ruffling and wearing it out. Compared to the influence of the organs of passion, it is as mild and wholesome nourishment, contrasted with alcohol; or like the genial warmth of the spring and autumn, with the burning heats of summer;—life and health and comfort may last long under the former, while all is parched and withered by the latter. Finally, a well-cultivated and well-balanced brain do much to produce a sound mind in a sound body. In proof of the principle here contended for, Dr Caldwell refers to the history of the fifty-six delegates who signed the American Declaration of Independence. All of them were men of well-cultivated and well-balanced minds; of these, two died of casualties in the prime of manhood; the aggregate of the years of the other fifty-four was 3,609, giving to each an average of 66 years and nine months;—an illustrious example of the influence of well-cultivated and regulated brains in conferring longevity on those who possess them. Several of these delegates lived beyond their 80th year, and some of them passed the age of 90.

That ease and quiet of mind conduce to long life, many facts warrant us in believing. It is well known that persons who live upon annuities, whose incomes are fixed, are longer lived than those whose sources of income are exposed to constant fluctuations. In the former case, the mind is freed from much of the anxiety and mental inquietude that attend the other condition of life. Human longevity and health are said to be greatly dependent on the state of the mind during sleep. Dr Brambilla, in alluding to the force with which the mind acts upon the body in dreams, states that he has seen instances of wounds in soldiers being inflamed, and putting on a gangrenous appearance, in consequence of the commotions excited in their bodies by irritating dreams. Plutarch, in his life of M. Brutus, says that a fever was excited in Cinna the poet, in consequence of his dreaming that he saw Cæsar the night after he was assassinated, and was invited to accompany him to a dreary place, to which he pointed, in order to sup with him.

Professor Caspar maintains that the clergy are longer lived than medical men. That of one hundred deaths, only forty medical men lived to the age of 62, while sixty-five divines survived that year. From six hundred and twenty-four deaths in town and country, Professor Caspar, of Berlin, has deduced the following ages at which one thousand medical men, and the same number of divines, died.

Between the Ages.	Medical Men.*	Divines.
23—32	82	43
33—42	149	58
43—52	160	64
53—62	210	180
63—72	228	328
73—82	141	255
83—92	30	70

That death has often resulted from great mental excitement, and that the undue exercise of the passions, cannot but prove destructive to health and longevity, no one will question. But a distinction ought to be drawn between the *exercise of the intellect* and the *excitement of the passions;* the former prolongs, and the latter shortens, life. All unnatural exertions of the mind must of course deteriorate the bodily health; the passions, when immoderately excited, are the bane of our existence. The poet of health has justly observed that—

> " 'Tis the great art of life
> To manage well the restless mind."

Sir A. Cooper had a young gentleman brought to him who had lost a portion of his skull just above the eyebrow. "On examining his head," says Sir Astley, "I distinctly saw the pulsation of the brain was regular and slow; but at this time he was agitated by some opposition to his wishes, and directly the blood was sent with increased force to the brain, the pulsations became frequent and violent. If, therefore," continued Sir Astley, "you omit to keep the mind free from agitation, your other means will be unavailing in the treatment of injuries of the brain." Dr Caldwell refers to a still more remarkable case which came under the notice of Dr Pierguin, in the hospital of Montpelier, in 1821. The subject of it was a female, who had lost a large portion of her scalp, skull-bone, and dura mater. A corresponding portion of her brain was consequently bare, and subject to inspection. When she was in a dreamless sleep, her brain was motionless

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* In 1821 the population of London was 1,200,000. There were 174 physicians, being one to every 7 000 inhabitants; there were 1,000 practising surgeons, being one to every 1,200 inhabitants; general practitioners, 2,000, or one to every 600 inhabitants; druggists, 300, or one to every 4,000. In 1821 the population of Paris was 810,000. Surgeons, 128, or one to every 6,000; physicians, 600, or one to every 1,300 inhabitants; general practitioners 180, or one to every 4,450.

London, total,	3474;	or 1	medical man	to every	345.
Paris,	„ 1310;	or 1	„	„	900.
Manchester,	238;	or 1	„	„	121.

and lay within the cranium; when her sleep was imperfect, and she was agitated by dreams, her brain moved and protruded without the cranium, forming cerebral hernia. In vivid dreams, reported as such by herself, the protrusion was considerable; and when she was perfectly awake, especially if engaged in active thought or sprightly conversation, it was much greater.

Dr Rush maintains that there are instances of persons who have derived health and long life from an exercise of the bad passions and emotions. Dr Darwin relates the history of a man who used to overcome the fatigue induced by travelling, by thinking of a person whom he hated. In support of his views, Dr Rush refers to the case of Benjamin Lay, who, notwithstanding his very irascible temper, lived to the age of eighty. He also states, in further corroboration of his opinions, that the debility induced by disease is often removed by a sudden change of temper. This is so common, that even nurses predict a recovery in persons as soon as they become feverish and ill-natured, after having been patient during the worst stage of their sickness. This peevishness, Dr Rush says, acts as a gentle stimulus upon the system in its languid state, and thus turns the scale in favour of life and health.

The argument of Dr Rush amounts to nothing. I cannot conceive by what process of reasoning he establishes that the exercise of the bad passions can conduce to health and long life. The "peevishness" to which he alludes, and which he considers to act favourably on the system as a stimulus, is but a symptom of returning health, and can have no such beneficial effect as that which he attributes to it.

Habits of intemperance affect considerably the duration of life. It is not only the habitual drunkard, who is suffering from organic disease caused by the abuse of spirituous potations, whose health is undermined by such unnatural indulgences, but the man who flatters himself he does not exceed the bounds of prudence, who limits himself to a fixed quantity of alcohol, and only occasionally allows himself to indulge in a debauch, also suffers in health, and brings on premature decay, without perhaps being conscious of the cause producing it. I cannot believe that, what is termed a moderate indulgence in the use of vinous and spirituous liquors, is as innocuous as so many thousands suppose. When the habit is confirmed, and the system has been accustomed for a number of years to the stimulus of wine or spirits, I can conceive that a temporary inconvenience would result from its sudden abstraction; but it would be much wiser to experience any deprivation of that kind, than lay a foundation for affections that would seriously impair the health and shorten life. In alluding to the influence of intemperance on longevity, Dr Reid eloquently observes—"Some leaves fall from a tree every time that its trunk is shaken, and the dreary nakedness of winter is present before that season would have commenced in the regular course of nature." I do not allude particularly to those organic affections of the liver, heart, brain, and stomach, which so often result from the use of spirits, because these are obvious to everybody, even to the drunkard himself, but it is my wish to point out the effects of what is called a moderate use of wine and spirits on the duration of life, and to establish that their daily use, even in small quantities, must of necessity interfere with the functions of the vital organs, and in that way bring on premature dissolution.

The Chinese erect triumphal or honorary arches to the memory of persons who live to the age of one hundred, thinking, that without a sober and virtuous life, it is impossible to attain to so great an age. Temperance is certainly the best security of health; and no man can reasonably expect to live long who impairs the vital powers by excess, which converts the most natural and beneficial enjoyments into the most certain means of destruction. The few instances of individuals who, notwithstanding their licentious mode of life, have attained considerable age, cannot be put into competition with the immense number whose lives have been materially shortened by such indulgences.

It is questionable whether the habits of snuff-taking and smoking affect much the duration of life. Tobacco, when taken internally, has a powerful effect in prostrating the energies of the nervous system. In the manufactories of snuff in France, the persons employed, amounting to upwards of 4,000 persons, are not liable to any peculiar diseases, and live, on an average, as long as other workmen. At one period, in Russia and Prussia, the penalty of death was attached to the use of tobacco in any form, excepting that of snuff, and for this the offending member—the nose—was cut off. Frederick the Great of Prussia was an inveterate snuff-taker. His pockets, which were lined with tin, were generally full of snuff, of which he took very large quantities. He died at the age of seventy-four. Dr Cullen relates several cases of severe dyspepsia caused by snuff. When the habit of snuff-taking becomes confirmed, it is not easy to abstain from its use, and life is often made miserable if the accustomed stimulus is abstracted from the olfactory nerves.

Although the habit of smoking, when carried to an extreme, must occasionally derange the health, it is not generally supposed to affect the duration of life. Sir John Sinclair obtained a return from Greenwich Hospital of all the pensioners above the age of eighty, from which it appeared that there were ninety-six who had attained to that period of life; and out of that number there were thirteen above ninety, and one above one hundred. Almost all the pensioners were inveterate smokers. At Kilmainham Hospital, in Ireland, there were thirty-one pensioners above the age of eighty, all of whom used tobacco freely, with one exception. Both Dr Christison and Mr Periera state, that they are unacquainted with any well-ascertained ill effects resulting from the habitual practice of smoking.

In alluding to those causes which affect the duration of life, the habit of opium-eating must not be overlooked. It is, however, a *vexata quæstio* whether an indulgence in that propensity does produce the consequences so generally ascribed to it. It is important that those who are alone competent to pronounce a sound opinion on the subject should do so, as the habit of opium-eating is said to have greatly increased of late in this country, particularly in the upper ranks of life. *Pari passu*, with the formation of temperance societies, has the consumption of opium augmented in Great Britain. There cannot, however, be a doubt that of the two evils intemperance produces a larger amount of human suffering, and tends more to occasion premature decay than an indulgence in the use of opiates. Upon this point there cannot be two opinions among those who are qualified to form an accurate judgment on the subject. I do not wish for one moment to defend the practice of opium-eating, for it is my firm conviction, founded on long observation and experience, that the habit is alike destructive to the health of the body and peace of the mind. Like an indulgence in the use of vinous and spirituous liquors, opium for a short period produces a temporary excitement of the mind, which gives rise to ecstatic emotions of pleasure.* But these sensations are ephemeral. When reaction takes place a vast amount of suffering is induced, which is only relieved by again having recourse to the pernicious opiate. Were I asked, however, the question—"Does opium-eating shorten life?" I must confess I should hesitate in answering it in the negative.

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* In 'The Confessions of an Opium-Eater,' the author (Quincy) thus describes his feelings when under the influence of the narcotic drug:—"The late Duke of —— used to say, 'Next Friday, by the blessing of Heaven, I propose to be drunk;' and, in like manner, I used to fix beforehand how often within a given

It has been clearly established that matrimony, if not entered into too early in life, is conducive to health and long life. Dr Rush states, that, in the course of his inquiries, he met with only one person beyond eighty years of age, who had not been married. Out of one hundred and twenty-seven aged, who were pensioners in the Hospitals of Greenwich and Kilmainham, there were only thirteen bachelors, whereas the remaining hundred and fourteen had been married men. Sir J. Sinclair states, that he found, in a list of persons who had lived to the extraordinary ages of one hundred and twenty and one hundred and sixty, not a single one unmarried; nay, they had all been married several times, and most of them again in the last days of their lives.*

M. Odier, Casper, and Departieux, have clearly established that marriage contributes very remarkably to the promotion of longevity. Odier endeavours to explain the fact, by supposing that women of sound and healthy constitutions are generally selected as partners for the nuptial state. This may be the case in many instances, but the majority of men who are disposed to marry are influenced by other considerations. Odier makes the difference between married and unmarried females to be on the average five years. A woman who marries at the age of twenty adds nine years and a half to the probable duration of her life.

M. Departieux, who made an average of 48,540 deaths, happening during a period of thirty years, observes—"That it would appear that people live longer in a state of marriage than in one of celibacy. The number of married men who die after the age of twenty is nearly one half less than the number of bachelors who die at the same period; and for forty-three married men, or widowers, who attain the age of ninety, we find only six unmarried men reaching the same age. The number of single women who die after the age of twenty is about four times greater than that of married females, or widows, dying after the same period of life; and fourteen virgins only (unmarried women) arrive at the age of

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time, and when I would commit a debauch of opium. This was seldom more than once in three weeks; for, at that time, I would not have ventured to have called every day (as I did afterwards) for 'A glass of laudanum negus, warm, and without sugar.' No; as I have said, I seldom drank laudanum at that time more than once in three weeks. This was usually on a Tuesday or a Saturday night; my reason for which was this: In those days Grassini sang at the Opera, and her voice was delightful to me beyond all that I had ever heard; and when she appeared in some interlude, as she often did, and poured forth her passionate soul as Andromache at the tomb of Hector, I question whether any Turk, of all that ever entered the paradise of opium-eaters, could have had half the pleasure I had. And over and above the music of the stage and the orchestra, I had all around me, in the intervals of the performance, the music of the Italian language talked by Italian women, for the gallery was usually crowded with Italians; and I listened with a pleasure, such as that which Wild the traveller lay and listened, in Canada, to the sweet laughter of the Indian women; for the less you understand a language the more sensible you are to the melody or harshness of its sounds."

* There are numerous instances on record of unmarried women living to a very advanced age. Mrs Malton died in 1733, aged 105; Ann Kerney died the same year, aged 110. Martha Dunridge died in her 100th year. Mrs Warren died aged 104. All these women had never been married.

ninety, for one hundred and twelve married women, or widows, who attain that advanced period of existence." This conclusion M. Departieux deduces from a series of tables which he formed and published in his able work.* For eleven bachelors who live beyond the age of seventy, there are no less than twenty-seven married men.†

Much discrepancy of opinion exists as to the relative value of male and female life. It has been asserted by Mr Finlaison that, according to his calculations, the life of a woman exceeds that of a man by five years and a half on the average. But it is evident that there must be a great fallacy in his tables.

It is stated by Dr Huffeland, that the equilibrium and pliability of the female body seem for a certain time to give it more durability, and to render it less susceptible of injury from destructive influences than that of men, but that male strength is, without doubt, necessary to arrive at a very great age. More women, therefore, become old, but fewer very old; and if registers of mortality, from which tables of the probability of the duration of human life are formed, were more extended, and comprehended a greater number of years, so as to include all cases of longevity, the difference between the value of male and female lives would appear less than it is supposed to be, and probably the sum of life of the whole of each sex approaches very nearly to an equality.‡

Does insanity tend to shorten life? Upon this point medical men are diversified in their opinions. Of 213 cases of mental derangement admitted at Hanwell, under the care of Dr Conolly, 15 were aged 60 and upwards; one was between 75 and 80; and 58 in 723 at Hanwell had been labouring under the disorder between 20 and 50 years. An action was brought in 1825 by the Providence Assurance Company, to recover 2,000*l.* insured upon the life of the Rev. Mr F——. The judge before whom the case was argued, said, in his address to the jury, that they had to consider whether insanity affected the duration of life? If such was the fact, they must find for the defendant; if not, for the plaintiff. The verdict was for the plaintiff, on the ground that insanity had no tendency to shorten the duration of life.§

Insanity is, however, often complicated with palsy and apoplexy, and under these circumstances, the probabilities of life are considerably diminished.

Simple gout is not generally supposed to affect longevity. Out of 152,000 persons who insured their lives at the Equitable Insurance Office, from the year 1800 to 1821, including individuals of every age and station in life, only 26 died of gout! In the absence of any metastasis of the disease to a vital organ, which often occasions sudden death, gout does not appear to shorten the duration of life.

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* 'Essay on the Probabilities of Human Life.' 1766.

† 'Vide 'Important Tabular Statements,' in vol. i, 1837, of 'Lancet.'

‡ It has been calculated that the relative number of sexes is the same in all parts of the world, viz., at birth twenty-one males to twenty females; but as the mortality among males during infancy exceeds that of females, the sexes at the age of fifteen are nearly equal. A late French writer, M. Giron, maintains, that agricultural pursuits favour an increase in the male, while commerce and manufactures encourage the female population. Throughout the world there are four births to one marriage. Improvements in public health are attended by a diminution of deaths and births. The principle is this: as the number of men cannot exceed their means of subsistence, *if men live longer, a less number is born*, and the human race is maintained at its due complement, with fewer deaths and fewer births, a contingency favourable in every respect to happiness.

§ See Mr Farr's letter on this subject, 'Lancet,' No 924.

CHAPTER V.

ON SOUND.

Sound has no existence independently of a sentient organ. It is only a sensation, like the odour of flowers. The phenomena result from a vibratory or tremulous motion produced by a shake on a sounding body, which motion causes undulations or waves in the air, which are communicated to the ear, causing a mental sensation termed sound. The sense of hearing is productive of a large amount of intellectual gratification. What causes more sublime emotions than the roaring of heaven's artillery, or the fall of a tremendous avalanche? and what excites in the mind conceptions so truly poetical as the distant murmur of some silvery stream as it meanders through its rushy bed? There are other associations connected with the subject of sound that come home to us with great force and feeling, and awake in the mind the most pleasing reflections. After a long separation from those, around whom the tendrils of the heart have entwined themselves, how truly delightful it is once more to hear the sound of the well-known voice breaking upon our soul, like sweet music floating from some glassy lake! Whatever changes the relentless hand of time may have made in the physical form and lineaments of the face, the voice remains unchanged, and is immediately recognised as belonging to one with whom we have, in bygone years, intermingled in sweet friendship. The poet has, in his most powerful conceptions, delineated the influences of the human voice over the mind. When Manfred endeavours in vain to perceive in the hectic phantom of Astarte the features of the being whom he loved, the mere whisper of the name revived the memory of " the voice which was his music," and invested her with the desired reality :—

> " Say on, say on,
> I live but in the *sound*. It is thy voice!"—Byron.

Who has not experienced the effect of music on his soul? The immortal bard has emphatically denounced those insensible to the influence of harmony as only " fit for treasons, stratagems, and spoils." As most of our mental pleasures are dependent upon association, it is natural to suppose that everything that tends to vibrate the " hidden chain " which connects our ideas, should create a large amount of gratification. Hence the delight — oft, alas! blended with painful recollections — which we experience from hearing the sound of music, recalling to the memory the companions of early life, who, perhaps, have long since slept beneath the cold green sod.

Who has not experienced extatic emotions of pleasure at hearing the distant sound of village bells, as they fell with delightful softness upon the ear? It is only in an upland country, says Gardner, that we can enjoy these sublime effects ; where the tones wind round the hill, or down the woodland dale. How their voices come swelling upon the ear, like the revelry of friends! but no sooner heard than the wind has swept them away, and they retire in the faintest whispers.

> "So have I stood alone on Isis bank,
> To hear the merry Christ Church bells rejoice;
> So have I sat, too, in thy honour'd shades,
> Distinguish'd Magdalen on Cherwell's banks,
> To hear thy silver Wolsey tones so sweet;
> And so too have I paused and held my oar,
> And suffer'd the slow stream to bear me home,
> While Wykham's peal along the meadows ran."

There are some men who cannot distinguish one delightful strain from another. To these a wise Creator has given as a recompense the music of nature,—the song of the birds, the hum of insects, the wind passing over the flowers, the breeze over the waters. That music retains its charm when the ear refuses to transmit sonorous impressions to the sentient organ, we have many evidences. Beethoven was deaf for many years previous to his death, but he still continued playing and composing, for he lived in the memory of his art, and revelled in the knowledge of his most delightful science. In his case music might be said to be the memory of sound.

For the production of sound three things are necessary. First, a sonorous body to give the impressions; secondly, a medium or vehicle to convey these impressions; thirdly, an organ of sense or ear to perceive them. It was long a matter of dispute whether sound was diffused into the air, in circle beyond circle, like the waves of water when we disturb its smoothness by dropping in a stone, or whether it travelled along like rays diffused from a centre, like light and electricity. It was reserved for the mighty genius of Newton to solve the mystery, and give a clear and satisfactory explanation of the phenomena. That distinguished philosopher has established that sound progresses by an undulatory or vermicular motion created in the air.

Any agitation in the parts of a sonorous body will cause a motion or undulation in the particles of air which are in immediate contact with it. These undulations spreading, as it were, in concentric circles round the body in every direction, strike upon the ear and produce the sensation of sound. This explanation of the manner in which sound is generated, is best illustrated by observing what takes place in another fluid when its particles are put in motion. When a stone is dropped into a pool of water, every one has observed the peculiar motion which it communicates: the surface is thrown into waves, which form in concentric circles, rapidly succeeding one another round the point of percussion; these circles spread in every direction, becoming, as they extend, fainter, till at last they are no longer distinguishable from the smooth surface on which they are encroaching.

Many facts establish that the air is the medium of sound, but none more clearly and satisfactorily than the following:—If a bell be suspended in the receiver of an air-pump, and then struck, the sound will be found to diminish as the air is exhausted, and again increase on its re-admission; and when made to sound in a vessel full of air, the sound is not transmitted through the interval between that and an exterior vessel from which the air has been extracted, though it passed freely when re-admitted. On the other hand, when the air was condensed in a receiver, the sound of a suspended bell was stronger than in the natural air, and its intensity increased with the degree of condensation.* Roebuck, when shut up in the cavity excavated in a rock, which served as a reservoir of air for an iron foundry in Devonshire, to equalize the blast of the bellows, observed the intensity of sound to be considerably augmented in the air thus compressed by their action.

Water, as well as air, is a vehicle of sound. Anderson made three people dive at once, and remain two feet below the surface of the water. When so situated, he spoke to them as loudly as he was able. His voice was heard by the men under the water, but indistinctly. He caused the same persons to dive twelve feet beneath the water, and discharged a gun over them, which they said they heard, but that the noise was scarcely perceivable. A grenade discharged about nine feet below the water, gave a prodigious hollow sound, and produced a violent concussion of the earth. According to M. Beaudant, sound moves in water at the rate of 4,921 feet per second. The perception of sound becomes much augmented when under water. The sensation of sound, when two stones held in the hands are struck together under water, is described by Dr Munro as being painfully acute.

Sound is transmitted to all solid bodies with great facility and distinctness. Messrs Herold and Rafn, two Danish philosophers, made the following experiment:—Having stretched a metallic wire six hundred feet long in a horizontal direction, they suspended at one end a plate of sonorous metal, and when this was slightly struck, the auditor at the other end, with the wire in his teeth, heard at every stroke two distinct sounds, one conveyed almost instantly along the wire, and the other transmitted more slowly through the air. Numerous experiments, with reference to the velocity with which sound travels through bodies of various solidity, yields the following results :—

	Velocity in feet per second.
Tin	8.175
Silver	9,810
Baked clay	10,900
Copper	13 080
Glass	18,530
Iron	18,530
Woods of different kinds	11,990 to 18,530

From ascertaining the velocity of sound in cast-iron, we are able to calculate the time it requires to transmit force, whether by pulling, pushing, or by a blow, to any distance, by means of iron bars or chains. It has been ascertained by Sir William Herschel, that for every 11,090 feet of distance, the pull, push, or blow will reach its point of action one second after the moment of its emanation from the first mover. Were the sun and the earth connected by an iron bar, 1,074 days, or nearly *three* years, must elapse before a force applied at the sun could reach the earth. With a bar of tin, nearly *seven* years would be necessary. A writer in the 'Quarterly Review' has placed this remarkable property of matter in a popular and paradoxical aspect, by imagining Titan and Saturn placed in opposite points of the orbit of the planet which bears the name of the latter; and their ancient combats being resumed with weapons of earthly fabric, the deadly blow dealt by the former would not slay its victim till after the lapse of fifty-two years; and if, one year before this event, Saturn should aim a mortal thrust at his antagonist, it could not prove fatal till fifty-one years after his own death!

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* Vide Hanksbee's 'Experiments in Philo. Trans.,' 1705.

Sound is transmitted with great rapidity and clearness along wood. If a solid piece of wood, of considerable length, be scratched with a pin at one end, the sound may be heard by applying the ear at the other. On this principle a most valuable instrument, termed the *stethoscope*, has been invented for the purpose of detecting diseases of the lungs and heart. In a healthy state of these organs, certain sounds are produced, and can easily be detected, by applying the ear to the chest, by the passage of the blood through the cavities of the heart, and of air through the air cells of the lungs. When the action of the heart or lungs becomes impaired by disease, these sounds become altered, and it is by detecting these unhealthy sounds that the skilful physician is able to discover the encroachments of organic disease, and thus, by a timely administration of remedies, stop the progress of affection that might otherwise speedily extinguish life.

Considerable difference of opinion exists as to the velocity with which sound travels through various gases. The following is the result of some experiments on this subject performed by Van Rees, Frameyer, and Moll :—

Hydrogen	2,000	feet per second.
Agate	1,109	,,
Oxygen	1,039	,,
Carbonic-acid gas	903	,,
Sulphurous-acid gas	751	,,

Sound is scarcely perceptible in hydrogen gas. In oxygen and carbonic-acid gas it is louder than in air. Hydrogen gas has also a remarkable effect in enfeebling the human voice.

With reference to the rapidity of the transmission of sound, philosophers differ widely. The following conclusions, however, are considered generally correct :—Sound travels four times quicker in water, and from ten to twenty times quicker in solids, than in air.

Sound travels through the air at the rate of 1,142 feet in a second, or near 13 miles in a minute, nor do any obstacles hinder its progress. The method of calculating its progress is easily understood. When a gun is discharged, we see the fire long before we hear the sound ; if, then, we know the distance of the place, and know the time of the interval between our first seeing the fire and hearing the report, it will show us exactly the time the sound has been in travelling to us. For example, if the gun is discharged a mile off, the moment the flash is seen, you take a watch, and count the seconds until you hear the sound—the number of seconds is the time the sound has been in travelling a mile. Again, on the same principle, we are enabled to discover the distance between objects which would be otherwise immeasurable. If ten seconds intervene between seeing the flash of a gun at sea and hearing the report, it follows that the distance is seven times 1,142 feet, being 24 yards more than a mile and a half. In like manner we calculate the distance of the clouds from whence thunder proceeds. We may easily calculate distance by the motion of sound by feeling the pulsations at the wrist ; each beat is nearly a second, and therefore indicates a distance of nearly a quarter of a mile.

In the cathedral of Girgenti, in Sicily, the slightest whisper is borne with perfect distinctness from the great western door to the cornice behind the high altar, a distance of 250 feet. By a most unlucky coincidence, the precise focus of divergence at the former station was chosen for the place of confessional ; secrets never intended for the public ear thus became known, to the dismay of the confessors and the scandal of the people, by the resort of the curious to the opposite point (which was accidentally discovered), till at length one listener having had his curiosity somewhat overgratified by hearing his wife's avowal of her own infidelity, the tell-tale peculiarity became generally known, and the confessional was removed.*

Dr Hutton relates, that on a quiet part of the Thames, near Chelsea, he could hear a person read distinctly at 140 feet distance, while on the land, the same could only be heard at 76. On the authority of Denham, Dr Young states that the human voice has been heard at a distance of ten miles across the Strait of Gibraltar. Guns fired at Carlseroon were heard across the southern extremity of Sweden as far as Denmark, 120 miles off. Dr Hearn, a Swedish physician, says that he heard guns fired at Stockholm on account of the death of one of the royal family in 1685, at the distance of 30 Swedish, or 180 British miles. During the Dutch war the guns were heard above 200 miles.† The large bell at Ersurt, in Germany, is heard at the distance of 24 miles. M. Biot made many interesting experiments respecting the transmission of sound: when a number of cast-iron conduit pipes, 3,120 feet long, were laid down in Paris, for the purpose of supplying the capital with water, M. Biot found the lowest whisper at one end was distinctly heard at the other, and that a pistol fired at one end actually blew out a candle at the other, and drove out light substances placed there with considerable violence. At Carisbrook Castle, in the Isle of Wight, is a well 210 feet in depth, and 12 in diameter, into which if a pin be dropped, it will be distinctly heard to strike the water. Dr Hutton refers to the wall of a garden that conveys a whisper nearly 200 feet.‡ The sound of bells is heard at a great distance early in the morning, when the air is still, and the ear has been refreshed by sleep. A sentinel was charged with sleeping upon his post on the ramparts of Windsor Castle; the life of this man was saved by the extraordinary circumstance of his having heard, at midnight, St Paul's clock strike *thirteen*, when it should have struck only twelve. The fact was proved by several witnesses, although it was imagined that the distance would have rendered the circumstance impossible. It was supposed the course of the river and the stillness of the night assisted the conveyance of the sound, which, like a miracle, saved the poor fellow's life.

The above interesting fact is a good illustration of the rapidity with which sound travels at night. From hearing the noise of the great cataracts of the Orinoco, in the plain which surrounds the mission of the Ossures, Humboldt concluded that the noise was three times louder at night than during the day. He thus accounted for the phenomenon. In a hot day, when warm currents of air ascend from the heated ground and mix with the cold air above of a different density, the transparency of the air is so much affected that any object seen through it appears to be in motion, just as when we look at any distant object over a fire or the flame of a candle. The air is, therefore, during the day, a mixed medium, in which the sounds are reflected and scattered through streams of air of different densities, as in the experiment of mixing atmospheric air and hydrogen. At midnight, on the contrary, when the air is transparent and of uniform density, as may be seen by the brilliancy and number of the stars, the slightest sound reaches the ear without interruption. In addition to Humboldt's theory, Sir W. Herschel makes the following observations :—"There is no doubt that the universal and dead silence generally prevalent at night renders our auditory nerves sensible to impressions which would otherwise escape them. The analogy between sound and light is perfect in this as in many other respects. In the general light of day the stars disappear ; in the continual hum of noises which is always going on by day, and which reaches us from all quarters, and never leaves the ear time to obtain complete tranquillity, those feeble sounds* make no impression which catch our attention at night. The ear, like the eye, requires long and perfect repose to attain its utmost sensibility."

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* 'Travels through Sicily,' by a Naval Officer.

† 'Philo. Trans.,' vol. cxiii, Dr Denham.

‡ "I know of no other insect, the tread of which is accompanied by sound, except indeed the flea, whose steps a lady assures me she always hears when it passes over her night-cap, and that it clacks as if it were walking in pattens."—KIRBY AND SPENCER ON INSECTS.

In a still night the voices of the workmen at the distillery at Battersea may be heard at Westminster Bridge, an interval of three miles. The watch-word at Portsmouth, it is said, can be heard at Ryde, in the Isle of Wight, a distance of four or five miles. The echo in Woodstock Park is repeated seventeen times by day, and twenty by night.

The artillery, at the siege of Genoa by the French, was heard at Leghorn, a distance of 90 miles. The firing at the battle of Waterloo was heard at Dover, a distance in a direct line of 140 miles, of which 110 were over land, and the remainder over water.†

In illustration of the extreme facility with which sounds are heard at a considerable distance in cold weather, Capt. Parry mentions a curious fact. When he was at Port Bowen, Lieut. Forster having occasion to send a man from the observatory to the opposite shore of the harbour, a measured distance of 6,626 feet, or about one statute mile and two-tenths, in order to fix a meridian mark, had placed a person half way between to repeat his directions ; but he found, on trial, that this precaution was unnecessary, as he could without difficulty keep up a conversation with the man at the distant station. Dr Clarke, in his travels, mentions a curious fact illustrative of the distance to which sound may be carried over level ground and a calm sea. During the passage from the Bay of Macri to Aboukir, the master of the vessel called the attention of the passengers to a low, gentle murmur on the water, continuing at intervals during the day, and proceeding, as they afterwards ascertained, from the fire of artillery on the fort of Rahmanie, distant above 100 miles.

Though the air at great altitudes scarcely transmits sounds of ordinary intensity, yet powerful commotions of the atmosphere, taking place at the tops of our highest mountains, force their way through its most attenuated strata. The explosion of meteors, in regions where the air is three thousand times more rare than that which we breathe, is heard like the sound of cannon on the surface of the earth. The great meteor of 1783 produced a distinct rumbling sound, although it was fifty miles above the earth at the time of the explosion. The sound produced by the explosion of the meteor of 1719, at an elevation of at least sixty-nine miles, was heard as "the report of a very great cannon or broadside." The report of a meteor in 1756 threw down several chimnies at Aix, in Provence, and was taken for an earthquake. Sir W. Herschel observes, that it may be contended that at these enormous heights sound may owe its propagation to some other medium more rare and elastic than air, and extending beyond the limits of the atmosphere of air and vapour.

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* Some of the smallest insects send forth noises during the night which are distinctly perceptible. The death-watch is a sound resembling the tick of a watch, and proceeds from a small spider. It has been supposed that the noise, which generally alarms persons of superstitious minds, proceeds from two insects, probably male and female, calling to each other.

† 'A. B. Webster on Sound.'

The propagation of sound requires a much denser medium than that either of heat or light; its intensity diminishes as the rarity of the air increases, so that at a very small height above the surface of the earth the noise of the tempest ceases, and the thunder is heard no more in those boundless regions where

> "The mountains kiss high heaven,"

and the heavenly bodies accomplish their periods in eternal and sublime silence.* A pistol fired on the summit of Mont Blanc will produce no greater report than a little Indian cracker would do in a room.

Sound, like light and heat, is capable of being reflected, and when so reflected from several places, it may be collected in one point, as into a focus, and it will be there more audible than in any other part, even than at the place from whence it proceeded. Whispering galleries are constructed on this principle. In sound, as in light, the angle of reflection is equal to the angle of incidence. When sound comes into contact with concave surfaces, it converges to a certain point after reflection; and a person situated near that point will hear the reflected sound more distinctly than the direct sound. If the reflecting surface be of an elliptical form, all the sound which proceeds from one point is reflected to the other. A person who whispers in one end of an oval room, can be distinctly heard at the other, although the sound is not audible to those placed between. The phenomenon which takes place in the "whispering gallery" of St Paul, results from the reflection of sound. A person standing near the wall, with his face turned to it, whispers a few words, which are heard by another who applies his ear to the wall at nearly the opposite side of the building, though the sound is not perceptible to those who are situated nearer the speaker. The "Hall of Secrets," in the Observatory of Paris, produces a similar effect. This hall is of an octagonal form, with cloister arches, or arched by portions of a cylinder, which meet at angles corresponding to those formed by the sides of the building. The speaker applies his mouth very near the wall to one of the angles, and the person situated at the opposite angle hears his voice distinctly. The wide-spread concave sail of a ship has sometimes collected sound to a focus so perfectly as to render audible the sound of bells a hundred miles distant. A notorious instance of sound-collecting surface was the ear of Dionysius, in the dungeons of Syracuse. The roof of the prison was so formed as to collect the words, and even whispers, of the unhappy prisoners, and to direct them along a hidden conduit to where the tyrant sat listening. The deception called the "Invisible Girl" is constructed on this principle. In the machine are hidden concave trumpets, which reflect the questions of visitors to the director, who is concealed at a distance; and his replies, as in the whispering gallery, become audible to the inquirers alone.

When sound is intercepted by an even surface, such as a wall, a side of a house, or a hill, it is driven back, or rebounds like a ball when thrown against a wall, and produces what is termed an echo. The sound of distant rolling thunder is caused by its being reflected from one cloud to another. The most appalling echoes are caused by the avalanches of snow from the summits of the high Alps in Switzerland. In alluding to the fall of these masses of snow, Mr Bakewell says,—"The noise was indescribably deep and awful; reverberating in long and repeated echoes, which truly might be called the music of the mountains, and was in perfect harmony with the vast sublimity of the scene. To these deep echoes succeeded a solemn silence, till again an appalling crash from another part of the range was repeated by louder bursts, responding from mountain to mountain. It would have required no very poetic imagination to have heard amid these sounds the mighty genii of the Alps holding conference together in an awful language, that spoke of the feebleness of human power compared with the force and immensity of nature."

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* Mrs Somerville.

Among the glaciers above the village of Moglan are echoes which repeat the same sound a great number of times; and, when once such a sound is produced, it is propagated and repeated from rock to rock, producing a prolonged *retentissement,* like that of a trumpet when it is blown loud and long. Dr Platt refers to the echo in Woodstock Park, which repeats seventeen syllables by day and twenty by night. The famous echo at the Marquess Simonetta's villa, near Milan, repeats a man's voice about forty times, and the report of a pistol sixty. This singular echo is occasioned by the reflection of the voice between the opposite parallel wings of the building, which are fifty-eight paces from each other, without any windows or doors, and perpendicular to the main body of the building. Near Rouen there is a curious oblique echo. A person singing hears only his own direct voice, while those who listen hear only the echo, which sometimes seems to approach, and at other times to recede from the ear; one person hears a single voice, another several voices; one hears the echo on the right, and another on the left—the effect constantly changing with the position of the observer.*

Sir W. Herschel, in speaking on the subject of echoes in churches and public buildings, lays down some important principles, deserving of the serious attention of architects. He says, in small buildings the echo is not distinguishable from the principal sound, and therefore seems only to strengthen it; but in very large buildings, where the original sound and its echo are distinctly separated, the effect is highly disagreeable. He proposes in cathedrals to remedy this bad effect by having the service read in a monotonous chaunt, which blends the voice in the same sound with its echo. In musical performances, however, that resource is not available. When ten notes are executed in a single second, as in many pieces of modern music, the echo, in the direction of the length of a room fifty-five feet long, will exactly throw the second reverberation of each note on the principal sound of the following note, wherever the auditory is placed. Under such circumstances, therefore, the performers should be stationed in the middle of the apartment. In the construction of rooms for performance of music, it is necessary to attend to the reflex action of sound. It is a fallacious notion that curvatures, circular walls, or arched roofs add to the musical excellence of a room. The harmony of the sound is destroyed in consequence of its rays being converged into large portions, and thrown into particular parts of the room. Our finest musical buildings are constructed in the figure of a parallelogram, or long square, in which the sounds are equally diffused. Mr Webster, in his interesting work on this subject, has laid down some important principles relating to the application of the phenomena of sound in the construction of public buildings, to which we direct the attention of those desirous of further information on this point.

The voice may be much improved by practising singing before a mirror. In the early schools of Rome, it was the custom daily to take the pupils beyond the walls to a stone celebrated for its echo, which repeated the same sound several times. There the scholars were exercised by making them sing opposite the stone, which, by distinctly repeating the sounds, warned them of their defects, and they were enabled to correct their errors with greater ease.

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* Memoirs of the Academy of Sciences.

Sir D. Brewster has noticed a singular phenomenon connected with sound. He observes, that as two strong lights may be made to produce darkness, so two loud sounds may be made to produce silence. His explanation is as follows :—"If two equal and similar strings, or the columns of air in two equal and similar pipes, perform exactly one hundred vibrations in a second, they will produce each equal waves of sound ; and these waves will conspire in generating an uninterrupted sound, double either of the sounds heard separately. If the two strings or the two columns of air are not in unison, but nearly so, as in the case where one vibrates one hundred, and the other one hundred and one times in a second, then at the first vibration the two sounds will form one of double the strength of either ; but the one will gradually gain upon the other, till at the fiftieth vibration it has gained half a vibration on the other. At this instant the two sounds will destroy one another, and an interval of perfect silence will take place." This curious phenomenon is thus explained :—When a wave is made in the surface of a still pool of water by plunging a stone into it, the wave advances along the surface, while the water itself is never carried forward, but merely rises into a height and falls into a hollow, each portion of the surface experiencing an elevation and a depression in its turn. If we suppose two waves, equal and similar, to be produced by two separate stones, and if they reach the same spot at the same time, that is, if the two elevations should exactly coincide, they would unite their efforts and produce a wave twice the size of either ; but if the one wave should be just so far before the other that the hollow of the one coincided with the elevation of the other, and the elevation of the one with the hollow of the other, the two waves would obliterate or destroy one another, the elevation, as it were, of the one filling up half the hollow of the other, and the hollow of the one taking half the elevation of the other, so as to reduce the surface to a level. These effects will be actually exhibited by throwing two equal stones into a pool of water, and it will be seen that there are certain lines of a hyperbolic form where the water is quite smooth, in consequence of the equal waves obliterating one another, while in other adjacent parts the water is raised to a height corresponding to both the waves united.

A cave is described in Finland, near Viburg, called Smellan, into which if a dog or other living creature be thrown, it sends forth so loud a sound that persons near the cave are knocked down.* Al. Magnus, speaking of the vast mountains of the northern province called Angermania, says,—"If any sailors should chance to approach the bases of these mountains, which stand in the midst of a deep gulph, they are struck with such horror from the prodigious dashing of the waves, that unless they escape by quick rowing, or by the wind favouring them, they become stupified with fright, or scarcely recover their senses or former health. The bases of these mountains have many winding cavities, stupendously formed, from whose deep recesses issues a dreadful sound, like subterraneous thunder." Violent concussions of the air, produced by thunder or guns, have been known to throw down large buildings ; death has often been known to result from sudden concussions of the atmosphere. Sir D. Brewster refers to the following singular fact :—When the peace was declared in London in 1697, two troops of horse were dismounted and drawn up in line, in order to fire their volleys ; opposite the centre of the line was the door of a butcher's shop, where there was a large mastiff dog of great courage; the dog was sleeping by the fire, but when the first volley was fired, it immediately started up, ran into another room, and hid itself under a bed: on the firing of the second volley, the dog rose, ran several times about the room, trembling violently, and apparently in great agony; when the third volley was fired, the dog ran about once or twice with great violence, and instantly fell down dead, throwing up blood from his mouth and nose.

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* Al. Magn. Histor., lib. ii, c. 4.

In explaining the phenomena of sound it is necessary that some general notion of the organ of hearing should be given to the reader. The external part of the ear is composed of a cartilaginous funnel, called the auricle, which is most admirably formed to receive the sonorous waves of sound which are reflected into the *meatus auditorius externus,* a passage leading to the internal ear.

In the construction of the external ear of animals we have beautiful evidence of the designs and wisdom of a benevolent Creator. In beasts of prey, such as lions, tigers, and wolves, the trumpet part, or concavity of the ear, stands forward, in order to seize the sounds that are before them, viz., the sounds of the animals which they pursue or watch. The ears of animals of flight are turned backwards, as in the hare and rabbit, to give notice of the approach of their enemy from behind, whence he may dart upon them unseen. At the bottom of the external passage of the ear is a thin membrane, stretched over a cavity termed the tympanum, called the *membrana tympani.* The sonorous wave directed into the ear strikes upon this membrane, causing it to vibrate like the membrane of a drum. Within the cavity of the tympanum are four small bones, called the *malleus, incus, orbiculare,* and *stapes;* the first bone is shaped like a hammer, the upper part of its head resting upon the cavity of the tympanum, from whence the handle extends downwards along the *membrana tympani.* This line, by means of several muscles, stretches or relaxes the membrane of the tympanum, according to the accuracy with which we wish to listen to sounds. Attached to the *malleus* is the *incus,* or anvil, and to these are connected the *os orbiculare* and *stapes.* The *stapes* covers a small hole, the *finestra ovalis,* leading to the labyrinth. The labyrinth, or innermost chamber of the ear, is one cavity, composed of three parts, viz., the *vestibule,* the *semicular canals,* and the *cochlea.* The labyrinth is lined with a fine, delicate membrane, upon which the auditory nerve is expanded, and is filled with a fluid like water. The Eustachian tube is a passage leading from the tympanum behind the membrane, and opens into the cavity of the mouth. The physiology of hearing is as follows:—The waves of the air enter the external part of the ear, and after coming in contact with the membrane of the tympanum, cause a tremulous motion, which is communicated to the *malleus, incus, orbiculare,* and *stapes,* which convey the undulation to the fluid in the labyrinth, through the *foramen ovale.* These tremours are directed to the nerve of hearing, which carries the impression to the brain.

Like the other senses, the hearing improves, and is rendered by long practice acutely sensitive to the most minute degree of sound. Indians and savages are able to detect the approach of the enemy at the distance of half a mile by applying the ear to the surface of the earth.* Blind people, by the incessant use they make of the ear, are able to judge of everything by sound.

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* The Spanish soldiers were formerly practically acquainted with acoustics; for, with the assistance of a long ear-trumpet placed on the ground, they were accustomed to listen to the conversation of the enemy's sentinels placed at a great distance from them.

Sir J. Fielding possessed a great faculty of this kind; he could recollect any thief who had been brought before him by the tone and accent of his voice for more than forty years. Cats and dogs can hear the movements of their prey at incredible distances. Rabbits, when alarmed, forcibly strike the earth with their feet, by the vibration of which they communicate their apprehensions to burrows very remote. Miners, in boring for coals, can tell by the sound what substances they are penetrating.

The ancient magicians made use of sound as a fertile source of illusion. There were 1,500 subterraneous apartments in the famous Egyptian labyrinth (which contained twelve palaces), in which the gods were supposed to speak in a voice of thunder. Pliny informs us, that these palaces were so constructed that their doors could not be opened without permitting the peals of thunder from being heard in the interior. The ancients constructed speaking or singing heads, which were made to give utterance to the oracular responses. The most famous head was that of Orpheus. This oracle had the credit of predicting the bloody death which terminated the expedition of Cyrus the Great into Scythia. Albertus Magnus is said to have made a head of earthenware which both moved and spoke. Thomas Acquinas was so terrified with it that he broke it in pieces, upon which the mechanist (Gerbert) exclaimed, "There goes the labour of thirty years!" In these deceptions the sound was conveyed by pipes from a person in another apartment to the mouth of the figure. That the deceptive character of sound often produces in the minds of the superstitious the most supernatural feelings, the two following narratives will fully testify.

A gentleman, devoid of all superstition, and living in a house free from any gloomy associations, heard, night after night in his bedroom, a singular noise, unlike any ordinary sound to which he was accustomed. He had slept in the same room for years without hearing it, and he attributed it at first to some change of circumstances in the roof or the walls of the room, but after the strictest examination no cause could be found for it. It occurred only once in the night—it was heard almost every night with few interruptions. It was over in an instant, and it never took place till after the gentleman had gone to bed. It was distinctly heard by his companions, to whose time of going to bed it had no relation. It depended on the gentleman alone, and it followed him into another apartment with another bed, and on the opposite side of the house. Accustomed to such investigations, he made the most diligent and fruitless search into its cause. The consideration that the sound had a special reference to him alone, operated upon his imagination, and he did not scruple to acknowledge that the recurrence of the mysterious sound produced a superstitious feeling at the moment. Many months afterwards, it was found that the sound arose from the partial opening of the door of a wardrobe, which was within a few feet of the gentleman's head, and which had been taken into another apartment. This wardrobe was almost always opened before he retired to bed, and the door being a little too tight, it gradually forced itself open with a sort of dull sound resembling the note of a drum. As the door had only started half an inch out of its place, its change of place never attracted observation. The sound, indeed, seemed to come in a different direction, and from a greater distance.

In one of the baronial castles of the north, which had been uninhabited for years, there were heard at times such extraordinary noises as to confirm the opinion among the country people that the house was haunted. In the western tower an old couple were permitted to live, who had been in the service of the former lord, but so imbued were they with the superstitions of the country, that they never went to bed without expecting to hear the cries of the disturbed spirits of the mansion. An old story was current that an heir apparent had been murdered by an uncle, that he might possess the estate, who, however, after enjoying it for a time, was so annoyed by the sounds in the castle, that he retired with an uneasy conscience and died in France.

Not many years ago the property descended to a branch of the female line (one of the heroes of Waterloo), who, nothing daunted, was determined to make this castle his place of residence. As the noises were a subject of real terror to his tenantry, he formed the resolution of sleeping in the castle on the night he took possession, in order to do away these superstitious fears. Not a habitable room could be found, except the one occupied by the old gardener and his wife in the western turret, and he ordered his camp-bed to be set up in that apartment. It was in the autumn, at nightfall, that he repaired to the gloomy abode, leaving his servant, to his no small comfort, at the village inn; and after having found everything comfortably provided, turned the old rusty key upon the antiquated pair, who took leave of him to lodge at a farm hard by. It was one of those nights which are chequered with occasional gleams of moonshine and darkness, when the clouds are riding in a high wind. He slept well for the first two hours; he was then awakened by a low mournful sound that ran through the apartments. This warned him to be up and accoutred. He descended the turret stairs with a brilliant light, which, on coming to the ground floor, cast a gigantic shadow of himself upon the high embattled walls. Here he stood and listened, when presently a hollow moan ran through the long corridor and died away. This was followed by one of a higher key, a sort of scream, which directed his footsteps with more certainty to the spot. Pursuing the sounds, he found himself in the great hall of his ancestors, and vaulting upon the large oaken table, set down his lamp, and folding his cloak about him, determined to wait for the appearance of all that was terrible. The night, which had been stormy, became suddenly still—the dark clouds had sunk below the horizon, and the moon insinuated her silvery light through the chinks of the mouldering pile. As our hero had spent the night in the chase Morpheus came unbidden, and he fell asleep upon the table. His dream was short, for close upon him issued forth the hurried groan. Amazed, he started up and sprang at the unseen voice, fixing with a powerful blow his toledo steel in the arras. The blade was fast, and held him to the spot. At this moment the moon shot a ray that illumined the hall, and showed that behind the waving folds there lay the cause concealed. His sword he left, and to the turret retraced his steps. When morning came, a welcome crowd, greeting, asked if he had seen the ghost? "O yes," replied the knight, "dead as a door nail he lies where my sword has pinned him fast; bring the wrenching bar, and we'll haul the disturber out." With such a leader, and broad day to boot, the valiant throng tore down the screen where the sword was fixed; when, lo! in a recess lay the fragments of a chapel organ, and the square wooden trunks made for hallowed sounds were used as props to stay the work when the hall was coated round with oak. The wondering clowns now laughed aloud at the mysterious voice. It was the northern blast, that found its way through the crannies of the wall to the groaning pipes, that had alarmed the country for a century past.*

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* Gardner's 'Music of Nature.'

CHAPTER VI.

THE ART OF BEING ILL; OR, THE METAPHYSICS OF MEDICINE.

It is my intention, in this chapter, to show how far the mind may be made instrumental, not only by the physician but by the patient himself, in the cure of disease. The application of metaphysical science to the practical purposes of medicine is a subject very little considered or comprehended by those whose duty it is to act as guardians of the public health. The majority of practitioners are but little versed in a knowledge of the philosophy of the human mind. To be a good physician it is necessary to be a tolerable metaphysician. It has been well observed that "the physician is often the poet, the artist, the third son of Apollo, and begotten under the influence of mild constellations. He that depends upon medicine alone, as such seeks corn in threshed sheaves. Medicine is but an instrument of cure, the physician heals not by it alone, but by the glance of the eye and animating word."

I am willing to admit that the system of medical education pursued in the present day is of so comprehensive a character, that the greater portion of the student's time must be devoted to the acquirement of that description of knowledge which is directly associated with his immediate pursuits. It may be urged that he has sufficient to engage his attention without entering upon what has been termed the "barren and unprofitable region of metaphysics,"—that he has little or no time to devote to the consideration of those branches of elegant and polite literature which have no direct bearing upon the practice of his profession, and that to some extent it may be said,

> "One science only will one genius fit,
> So vast is art, so narrow human wit."

It is not my intention on this occasion to point out the intimate relationship that exists between the science of medicine and other branches of knowledge which have no evident alliance with each other. However indisposed the student of medicine may be to perceive the connexion between his own studies and those which engage the attention of the lawyer and theologian, he cannot, upon consideration, deny the almost indissoluble union between the science of mind and the science of medicine. The medical philosopher has daily opportunities of witnessing the action of the mind upon the body, and the reaction of the physical organization on the mental operations. A physician ought to be, in the most enlarged signification of the term, a philosopher. He is daily called upon, in the practice of his profession, to act upon the body through the medium of the mind. He perceives the almost overwhelming influence which mental excitement has upon the health, in rousing, abnormally, the vital actions; and he also has to take cognizance of the pernicious effects which mental depression gives rise to in depriving the organs of life of that stimulus which is so necessary to the proper performance of their functions.

It may be laid down as an indisputable axiom, that in proportion as the physician makes himself intimately conversant with the connexion that exists between certain organs and the passions of the mind, so will he render himself an efficient practitioner. In the majority of the cases of disease, for the relief of which he is called upon to administer, considerable mitigation may be afforded by paying attention to the proper regulation of the mind. I do not maintain that an attack of *pneumonia* or *gastritis* can be cured either by an effort of the will, or by subduing the action of the heart by depressing the passions of the mind; but what I affirm is this, that there is a class of affections connected with a deranged condition of the brain and nervous system which mainly owes its origin to ill regulated mental emotions, and for the cure of which the mind is the principal agent.

The passions may be divided into those that excite the vital powers or rouse the faculties into action, and such as depress and debilitate them.

That the mind is in some mysterious way closely connected with the nervous system is an undeniable axiom in physiological science; and it is equally self-evident that the nervous chords are made the channels for conveying mental impressions from the brain, the seat of all sensibility, to various portions of the human frame.

If all diseases do not owe their origin to a derangement of the nervous functions, it must be clear to every medical man conversant with the practice of his profession, that every malady is more or less powerfully modified by anything that excites abnormally the nervous system.

The numerous class of fevers and inflammations very frequently owe their existence to primary affections of the brain and nervous structure. This need not surprise us when we consider how close the relationship is between the vascular and nervous systems, and how impossible it is to affect one without influencing the other.

In the excitement of mind which produces the phenomenon of blushing, we have a familiar illustration of the reciprocity alluded to. The nervous perturbation acting upon the heart and arteries, produces an immediate determination of blood to the minute capillary vessels which ramify in great numbers on the surface of the face.

In the application of moral or mental therapeutics, much skill and judgment are required. It is necessary that the physician in the first place should study the character and disposition of his patient, that he should make himself conversant with the condition of his mind before the malady developed itself. Having effected this object, he should endeavour to secure the confidence of the patient. In some instances it will be necessary to work upon the fears and apprehensions of the invalid; on other occasions he will see the necessity of pursuing an opposite policy. In diseases in which debility is the prominent symptom, those affections of the mind which rouse the torpid condition of the bodily frame must be called into action.

Jordanson remarks, in speaking of the ravages which the scurvy made among the men under his command, that "Whatever discouraged the seamen, or damped their hopes, never failed to add new vigour to the distemper; for it usually killed those who were in the last stages of it, and confined those to their hammocks who before were capable of some kind of duty."

At the siege of Breda in 1625, that city had suffered from the effects of a long conflict, and the inhabitants had experienced the miseries of fatigue, bad provisions, and anxiety of mind. The scurvy had also made much progress among the besieged. The place was on the eve of being surrendered to the enemy, when the Prince of Orange introduced letters to the men, promising them speedy assistance. A medicine, which was represented to possess wonderful efficacy, and to be almost beyond price, was forwarded for the use of the garrison; three small phials containing this precious panacea were given to each physician. This stratagem was completely successful. It was stated that three or four drops were sufficient to impart a healing virtue to a gallon of liquor. Invalids flocked in crowds to the physicians. Many who had not moved their limbs for months before were seen walking the streets perfectly well. Dr Lind, who relates the particulars of this circumstance, says they were told him by an eye-witness, an author of great candour and veracity, who wrote down every day the state of his patients, and who appeared to be more surprised at their unexpected recovery than he would have been had he been aware of the great influence which the exhilarating passions exercise over scorbutic disease.

Among the most frequent causes of scurvy are the depressing passions. There are many well authenticated cases of persons with this disease dying suddenly from grief. Rouppe relates a singular instance which he witnessed when on board a vessel commanded by Captain Everson. When they were mustering the ship's crew, one of the sailors, who was afflicted with scorbutic disease, requested, with great earnestness, his discharge. M. Rouppe said that, before discharging him, it would be necessary to restore him to health, and gave this as a reason for not immediately complying with his request. The poor man looked the picture of despair and despondency—his disappointment was great: "Very well," said he, "I shall go below, but you will soon find me dead." He died the same night.

Dr Armstrong, who knew well the importance of attending to the mind of the patient, said to Dr Boot a few hours before he died—"Boot, remember to be always cheerful in your intercourse with the sick; it takes a load from the heart, and infuses into it hope and confidence." Dr Nichols, in his 'De Anima Medica,' says, that whatever a man's distemper was, he would not attend him as a physician if his mind was not at ease, for he believed no medicine would have any influence under these circumstances. He once attended a man in trade, upon whom he found none of the medicine he prescribed have any effect. He asked the wife privately whether her husband had not been exposed to some losses in trade? She said, "No." He continued to attend him, but no impression could be made on his malady. At length the man's wife told the physician that she had discovered accidentally that her husband's mind was much troubled by his pecuniary difficulties. When Dr Goldsmith was dying, Dr Turton said to the poet, "Your pulse is in greater disorder than it should be; is your mind at ease?" Goldsmith replied that it was not, and he feared that his death had been accelerated thereby.

Much of our success in practice will depend upon placing about patients persons of cheerful and lively dispositions. How often have our best directed efforts proved abortive, owing to the mind of the invalid being depressed by the looks and conversation of those in attendance. It is the sacred duty of those associated with the sick to co-operate with the physician, by encouraging the hopes of the patient, and inspiring confidence in the means used to promote recovery.

Very frequently the object of the physician is thwarted in the administration of a particular medicine in consequence of the mind being in an excited state. A case is related, showing the influence which great mental perturbation has over the operation of the most potent medicines. A lady with a disordered mind resolved on death, and swallowed much more than half a pint of laudanum; she closed her curtains in the evening, took a farewell of her attendants, and flattered herself she would never be awakened from her sleep. In the morning, however, notwithstanding this incredible dose, she awoke apparently in the agonies of death. By the usual means she was enabled to get rid of the poison she had so largely taken, and not only recovered her life, but what is more extraordinary, her perfect senses! Her disordered mind was supposed to have prevented the laudanum from producing its usual fatal effects.

Some years ago I attended a lady who laboured under an affection accompanied by great mental dejection. She was nursed by a female relative, who paid every attention to her that kindness and humanity could suggest. The patient, however, did not advance towards recovery. She was firmly possessed with the idea that her disease would prove fatal, and this notion was encouraged by the conversation of the female in attendance. The character of the nurse's mind was naturally melancholic. Whenever she approached the invalid she poured forth bitter lamentations; she groaned and sighed, until the poor girl was induced to believe not only that she was at death's door, but that she was destined to be eternally lost. Her mind had thus been powerfully acted upon without my knowledge, and she was daily sinking under its influence. I happened to visit her one afternoon when the kind but inconsiderate nurse was sympathising with the patient on the awful result which was fast approaching. I saw at a glance the cause of all the mischief against which I had been in vain contending. I insisted upon having another nurse to attend the invalid—my wishes were complied with—need I say what was the result? An immediate improvement took place, and in a few days the patient was able to leave her chamber, where she had been confined for some weeks, and where she would have died had the nurse been allowed, by her injudicious course of procedure, to prostrate those mental energies which it was her duty to have stimulated by encouraging hope and confidence.

The following are mental qualifications which Dr Thomson considers indispensable to those who perform the office of sick nurse. He observes, "It is scarcely requisite to say that an attendant upon the sick should possess a happy, cheerful, equal flow of spirits, a temper not easily ruffled, and kind and sympathetic feelings; but, at the same time, not such as to interfere with firmness of character. The expressions of the countenance should be open and winning, so as to attract the good will and confidence of the invalid; a pleasing and gentle manner being more likely to gain esteem, and assure obedience to the orders of the physician, than the most persuasive arguments which can be addressed to his understanding.

"Although beauty is not a quality to be sought for in a sick nurse, yet we are so accustomed to associate it with amiableness and gentleness of manner, that a certain degree of good looks is a recommendation. In sickness, when the mind is weakened, and the nervous system morbidly susceptible, a harsh look or an unkind expression sinks deep into the mind of the invalid ; and when the disease is of a nervous kind, a melancholy, anxious, or foreboding look, or one which in any degree indicates an apprehension of danger, either in the physician or nurse, instantly excites alarm in the mind of the invalid, and may counteract, in a great measure, the influence of the medical treatment."

> " Is there no hope? the sick man said.
> The silent doctor shook his head ;
> And took his leave with signs of sorrow,
> Despairing of his fee to-morrow."
>
> GAY.

The sanative effect of recalling to the mind pleasing associations, when the body is prostrated by disease, is beautifully illustrated in the two following anecdotes. We refer to them not because they present anything novel, but on account of their embracing an important principle of moral treatment.

Dr Rush, the American physician, says, " During the time that I passed at the county school in Cecil county, Maryland, I often went on a holiday, with my school-fellows, to see an eagle's nest on the summit of a dead tree in the neighbourhood of the school, during the time of the incubation of the bird. The daughter of the farmer in whose field the tree stood, and with whom I became acquainted, married, and settled in this city about forty years ago. In our occasional interviews we now and then spoke of the innocent haunts and rural pleasures of our youth, and, among others, of the eagle's nest in her father's field. A few years ago I was called to visit this woman when she was in the lowest stage of typhus fever. Upon entering the room I caught her eye, and, with a cheerful tone of voice, said only, 'The eagle's nest.' She seized my hand, without being able to speak, and discovered strong emotions of pleasure in her countenance; probably from a sudden association of all her early domestic connexions and enjoyments with the words which I uttered. From that time she began to recover."

Sir John Malcolm, in his interesting sketch of his friend Dr Leyden, observes, speaking of the Doctor, " that his love of the place of his nativity was a passion in which he had always a pride, and which, in India, he cherished with the fondest enthusiasm. I once went to see him when he was very ill, and had been confined to his bed for many days. He inquired if I had any news. I told him I had a letter from Eskdale: and 'What are they about on the Borders?' he asked. 'A curious circumstance,' I replied, 'is stated in my letter;' and I read him a passage which described the conduct of our volunteers, on a fire being kindled by mistake at one of the beacons. This letter mentioned, that the moment the blaze, which was the signal of invasion, was seen, the mountaineers hastened to their rendezvous, and those of Liddesdale swam the Liddal river to reach it. They were assembled (though several of their houses were at a distance of six or seven miles) in two hours, and at break of day marched into the town (a distance of about twenty miles from the place of assembly) to the Border tune of 'Wha dar meddle wi' me?' Leyden's countenance became animated as Sir John proceeded with this detail, and at its close, although the Doctor had been previously too weak to rise from his bed without assistance, he sprung out on the floor, and with strange melody, and with stranger gesticulation, sang aloud, 'Wha da meddle wi' me—wha da meddle wi' me?' and from that day a sensible amendment took place, and he soon recovered from the effects of the malady under which he was labouring."

In the treatment of insanity,—melancholy and other affections in which the mind is almost exclusively disordered,—everything depends upon the physician paying strict attention to the regulation of the mind and feelings of the patient.

Insanity caused by erroneous views of religion occurs most frequently in young persons of acutely susceptible feeling, and requires the most delicate and cautious management. For the cure of this species of insanity two erroneous modes of treatment are adopted. The one consists in hurrying the individual into the distraction of company or on a rapid journey, the other in directing the attention to the consideration of works on controversial divinity. Both systems of treatment are attended with bad results, particularly the latter, for every attempt to discuss the important subject to which the distorted impression refers, only serves to fix the hallucination more deeply on the imagination. The mode of treatment suggested by Dr Abercrombie, under these circumstances, consists in enforcing regular exercise, paying attention to the general health, and adopting a course of reading likely to fix the mind, and withdraw it from the delusions under which it is labouring. A course of historical reading has been found to be most beneficial in these cases. The patient should be made to write out the dates and leading events in the form of a table. When the mind has been thus gradually exercised for some time, in a connected train of thought, it is often astonishing to observe how it will return to the subject which had entirely overpowered it, with a complete dissipation of former erroneous impressions. It is questionable whether in this form of insanity travelling is of much benefit. It was observed to Aristotle that a particular friend had derived no benefit from his travels. "That is owing," said the philosopher, "to his having travelled along with himself." It is not easy to "pluck from the memory a rooted sorrow." As long as the patient carries with him a disquieted mind, but little hope may be entertained of change of scene or rapidity of movement effecting much good.

Dr Gooch justly observes that "There is a stage in insanity, approaching convalescence, in which the bodily disease is lessening its hold over the mental faculties, and in which the latter are capable of being drawn out of the former by judicious appeals to the mind."

"Convalescence from insanity," says Dr Conolly, "like convalescence from a lingering fever, is a state intermediate between disease and health; and very slight circumstances may retard or promote the patient's perfect restoration."

A patient who had been labouring under a religious delusion of mind had exhibited symptoms of amendment, and he was accordingly allowed admission into the convalescent ward. There he unfortunately met a patient whose derangement had been manifested in a similar manner, and the two lunatics, who were considered to have nearly recovered, relapsed into their former state, and the mental delusion became as strong as ever.

This case shows the importance of adopting a proper system of classification. If in cases which are considered to be curable the lunatics are allowed to associate with each other, the chances of restoration to sanity will be materially diminished. We concur in the opinion of Dr Conolly, that convalescents should not even associate with convalescents, except under the strict surveillance of persons of sound intellect. The religious despair of one patient will often bring back and confirm the religious despondency of his neighbour. The passions and violence of those who are parading in the airing grounds revive the passions and ravings of those who are becoming more composed.

A musician confined in the Bicêtre, as one of the first symptoms of returning reason, made some slight allusion to his favourite instrument. It was immediately procured for him; he occupied himself with music for several hours every day, and his convalescence seemed to be advancing rapidly. But he was then unfortunately allowed to come frequently into contact with a furious maniac, by meeting him in the gardens. The musician's mind was unhinged; his violin was destroyed, and he fell back into a state of insanity which was as confirmed as hopeless.*

The physician ought carefully to watch the first dawnings of convalescence, for at this period he can effectually bring into operation his moral agents. How often is the first glimmer of returning reason manifested by a change in the patient's feelings towards his friends and relations. A youth who was confined in an asylum, and whose insanity consisted in a complete perversion of his feelings towards those whom he ought most to have respected, suddenly exclaimed, in the hearing of the surgeon of the establishment, "I love my father." This exhibition of parental affection was considered as an indication of returning sanity, and the family was allowed access to the patient, and the most cheering results ensued.

A young lady of great beauty and accomplishments manifested the first symptoms of mental health by the willingness she expressed to indulge in music, of which she had, prior to her attack, been passionately fond. She had often been urged to play some favourite airs, but had sullenly refused compliance with the wishes of those around her. One afternoon she was seen more than usually contemplative; she appeared anxious to avoid the company of one or two lunatics who had access to the same ward; her look became mild and gentle, and many other favourable signs presented themselves. Under these circumstances it was thought advisable to bring her in contact with a harp, a musical instrument she was devotedly partial to. Instinct almost directed her steps to it, when she immediately commenced playing several airs which were associated with other and happier scenes. The effect produced was almost instantly perceptible, and so beneficial an influence did the melody and the ideas which it called up to the mind have, that in a very short period she was considered sufficiently recovered to be removed to her own home.

In cases of melancholia the physician has ample scope of testing the efficacy of his moral tonics. At one period there was erected, at the two extremities of Egypt, temples dedicated to Saturn, to which those labouring under melancholia were recommended to go in search of relief. Some cunning priests, profiting by the credulity of the hypochondriacs, associated with the pretended miracles of the powerless divinities and their barren mysteries, natural means, by which they always solaced their patients, and succeeded often in curing them, by amusing the mind and inspiring hope and confidence. Everything was done that ingenuity could suggest to divert the mind. Voluptuous paintings and seducing images were opened to view. Agreeable songs and melodious sounds perpetually charmed their ears. Gardens of flowers and ornamented groves furnished delightful walks and delicious perfumes. Every moment was consecrated to some diverting scene and amusement, which had a most benign influence on the disordered imagination, interrupted the train of melancholy thought, dissipated sorrow, gladdened the heart, and wrought the most salutary change upon the body through the medium of the mind. The Egyptian physicians advised the patients to repair to those famous temples, as the faculty of the present day suggest a trip to fashionable spas.

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* Pinel.

Music has unquestionably a very powerful influence over the mind, and through that medium upon the body. In certain morbid conditions of the system music is a valuable remedial agent. Two modes are adopted to explain the operation of music on the animal economy. The monotony of the sound is said to have a soothing effect, similar to that which results from listening to the distant gurgling of a mountain stream or cataract. How often has the irritation of the nervous system been allayed, and sleep been induced, when all narcotics have failed to "steep the senses in forgetfulness," by the music caused by the waves dashing upon the sea beach. In Mackenzie's 'Man of Feeling' the soporific effect of the repetition or monotony of sound is beautifully illustrated. When Mr Harley arrives in London, he finds that the noise and varied excitement of the metropolis increases his nervousness and prevents him from sleeping. Ordinary narcotics produce no effect upon him, and he would have continued to suffer from watchfulness if he had not happily touched his shoe-buckle, which lay upon the table, when the vibration, or monotonous sound, so closely resembled the voice of his good aunt (who nightly read him asleep in the country) that for that time he regularly used the same narcotic, and always slept soundly.

The attachment of the Swiss to their native soil, notwithstanding the severity of the climate, is one of the most prominently developed features in the character of the inhabitants of the dark and rugged mountains of Switzerland. Poets and orators have entered into chivalrous rivalry to celebrate the romantic affection of the Swiss for their own mountainous and bleak wilds. Goldsmith says, in allusion to this subject,

> "Dear is the soil to which his soul conforms,
> And dear the hill which lifts him from the storms;
> And as a child whom scaring sounds molest
> Clings close and closer to its mother's breast,
> So the loud torrent and the whirlwind's roar
> But bind him to his native mountains more."

It is well known that when the Swiss are separated from their dearly loved country for any length of time, they are attacked with a disease termed *nostalgia*, which often produces the most fatal consequences. In Switzerland there is a favourite dance which the young shepherds perform to a tune played on a kind of bag-pipe. It is of a wild and irregular character, but so intoxicated are the lower order of Swiss with it, that if they hear it played when on foreign service, it creates such an intense desire to revisit their native homes, that, if not gratified, disease and death are known to result. So powerful an effect had this music on the minds of the Swiss troops in the French army, that orders were issued that the tune should not be played in the Swiss regiments, on pain of death.

From the annals of quackery the practitioners of medicine may learn many useful lessons. The maxim, *Fas est ab hoste doceri*, is as applicable to medical as to moral and political science. The secret of the success of a nostrum is often owing to the invalid relying most implicitly on its much vaunted efficacy. The empiric says, his medicine will cure,—it is infallible, it never has been known to fail. It is swallowed with this assurance.

The patient allows no doubt to glimmer in his mind, he has the fullest confidence in the virtues of the medicine, and a cure is effected. How much our success in the treatment of disease depends upon our being able to inspire hope and to secure the confidence of the patient. Implied faith between the invalid and the doctor is said to be the sheet anchor of both. Take this, and it will make you whole, is a cordial to the heart. An indigestion which has defied the skill of a Johnson, a Philip, and a Paris, has vanished before an infinitesimal dose exhibited by a disciple of Hahnemann; and an ague which has baffled the combined efforts of a legion of physicians, has vanished before the spell of a village witch!

A patient who was afflicted with a moral malady, as a *dernier resort* surrendered himself into the hands of a quack, with an understanding that he was not to expect a change before six months. A friend who saw the daily fee, and daily deceit, expostulated with the deluded man, who exclaimed, "For God's sake destroy not the hopes that man holds out to me; upon them I live, without them I die!" How often do we see disease which has resisted the ordinary means of cure, yielding solely to the influence of the mind reposing confidence in the impostures of designing charlatans.

He who has the least fear of dying has, *cæteris paribus*, the fairest chance to survive. Hope is a modification of joy, or rather joy by anticipation. It exercises a remarkably tonic influence on the body, and is so pleasing and invigorating that it has been termed emphatically the "balm of life." It preserves the mind from stagnating in its present possessions, corrects the uneasiness of desire, and animates the mind to struggle fearlessly with the difficulties which may beset it. He who gave away all he had, reserving only hope, made not so ill a bargain as may be imagined; he took for himself that which is sweetest in life.

In many cases, when the nervous system is in a debilitated and depressed condition, it will be necessary to rouse the mental and physical energies of the patient, in order to enable him to withstand the influence of disease. Aretœus, a celebrated ancient physician, being fully sensible of supporting the strength of the system in many nervous affections, expressly counsels the patient to be of good heart, and advises the physician to entertain him with such discourse as might have the tendency of encouraging his hopes of recovery. Aretœus has given minute instructions connected with the moral treatment of disease. In particular nervous affections he has directed that the eyes of the patient should be entertained with the sight of plants, fine paintings, particularly those calculated to awaken in the mind pleasing ideas; he also recommends that the bed of the patient should be placed near a window commanding a beautiful prospect; he directs the chamber to be strewed with flowers, so as to resemble the face of the country in spring. He suggests the introduction of music, and proposes that amusing books should be read, in order to prevent the patient's mind from dwelling on his disease, and thus preventing recovery. Everything should be done to inspire hope and confidence. Hope invigorates the system, and renders it less susceptible of the action of contagion. Thucydides says, when speaking of the plague of Athens, that the most affecting circumstance connected with it was the dejection of mind which attended the first attack; for the mind sinking at once into despair, the patient gave himself up without a struggle. Whenever Rome was threatened with a pestilence, the authorities marched with great pomp in solemn procession to the temple dedicated to Febris, into which a nail was driven. This was supposed to appease the angry deity, and it inspired the people with confidence, and rendered the epidemic, if it appeared, less fatal and general. It is only upon this principle that we can account for the wonderful efficacy which some charms were supposed to have in preserving the body from the influence of contagious infection.

Kant wrote a metaphysical essay on the art of curing physical disease by an effort of the will. I have not the dissertation by me to refer to, but it struck me some ten years back, when I perused it, as containing many valuable truths, mixed up, however, with ideas too transcendental for ordinary comprehensions. An obsolete writer on the philosophy of morals carried his notions on this subject to so great an extent as to affirm that no one need die, if, with a sufficient energy, he determined to live! The case of Col. Townsend, related by Cheyne in his 'English Malady,' is often referred to, as exhibiting very forcibly the influence which the will sometimes has over the actions of the physical organs. That gentleman, by an effort of the will, could suspend the action of the heart; after doing so he could remain some time apparently dead. The heart would again recover its powers, and animation be restored. Celsus refers to a priest who had the same power over the vital organs, and who, in the language of Burton, "could separate himself from his senses when he list, and lie like a dead man, void of life and sense."* "Qui, quoties volebat, mortuo similis jacebat, auferens se a sensibus." Cardan boasted that he could do the same whenever he wished. I do not consider the cases just cited as legitimate illustrations of the power of volition over the animal economy. In those instances there was no doubt a peculiar physical conformation of nervous and vascular structure, which would account for the phenomena exhibited. That much good may be effected in certain disordered conditions of the nervous system by an effort of the will, cannot be doubted. There are many affections in which the

"Mind must minister to itself."

This is remarkable in the case with reference to derangements of the mind —if the patient is unable, by an effort of the will, to "pluck from the memory a rooted sorrow," when the disorder of the intellect has attained to an advanced stage, he has certainly the power, in the incipient state of insanity, of destroying, by a persevering effort of his own mind, those false impressions, which, if allowed to exist, ultimately produce confirmed mental derangement. Persons predisposed to insanity should endeavour to crush the first appearance of a departure from a healthy train of thought. Those who are disposed to take a gloomy view of their mental or physical condition should endeavour to encourage a cheerful state of mind. This may prove difficult at the commencement, but by a constant, continued, and persevering effort of the will, all difficulties will be surmounted. It has been eloquently observed by Dr Reid, that "by endeavouring, from benevolent motives, to smother the expressions of our sorrows, we often mitigate their inward force. If we cannot imbibe the spirit, it is often profitable as well as a good-natured hypocrisy, to put on the appearance of cheerfulness:"

"By *seeming* gay, we grow to what we seem."

Dr Reid continues,—"The importance cannot be too deeply impressed of counteracting a tendency to this disease. When it is fully formed and established by habit, our efforts will seldom prove of any avail. We might in that case as well almost attempt, by the spell of a professional recipe, to break asunder the chain which binds the body of a maniac to the floor, as the strong concatenation of thought which is still more closely riveted around his mind. In a derangement of the intellectual faculties, the first moment of its appearance is often the only one at which it may be combated with any certainty of success. The smallest spec on the edge of the horizon ought to be regarded with awe, as portending, if not speedily dispersed, an universal and impenetrable gloom.

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* 'Anatomy of Melancholy.'

"It is not in the adult and fully established form of insanity that we can best learn its origin, or become thoroughly acquainted with its character. A mad-house is, on this account, an insufficient school for acquiring an intimate and correct knowledge of madmen. No man, by studying merely a *hortus siccus*, would think of making himself a botanist. In order to lay any claim to that title, he must contemplate images of beauty, not as they are pinned down in a portfolio, but at the period when they first emerge from the soil, and at every successive stage of their history and growth."

With reference to the exhibition of religious consolation, under circumstances of pain and sickness, the exercise of great judgment and discrimination is necessary. In some stages of certain diseases, particularly when the nervous system is affected, how much evil often results from the indiscreet excitement of mind consequent upon the untimely administration of the divine precepts of our holy religion? Under certain circumstances we feel assured that the conversation of a clergyman of cheerful piety and good sense, in whom the sick man confides, may often be of more consequence in composing the anguish of his mind than all the drugs in the *materia medica;* whilst, on the other hand, a gloomy and wrong-headed enthusiast may terrify him to distraction, and shorten a life which might otherwise have been prolonged.

It is not always consistent with a patient's safety to make him aware of his danger; for the consciousness of being in a perilous condition often accelerates the fatal termination of the disease. Whenever I hear a patient express a conviction that recovery is hopeless, I feel that I have fearful odds to contend against. "I shall die before the morning," said a patient to me, and by two o'clock death had seized its victim. I feel assured that this fixed consciousness of the approach of the last struggle interfered with the means used to promote recovery.

On the subject of religion it behoves us, however, to speak with great caution. No class have such frequent opportunities of witnessing the cheering, elevating, and consoling influence of spiritual instruction in the hour of sickness and death, as medical men. And yet how often is the administration of this sacred remedy abused. The object of religious consolation is to soothe, not to distract the mind; its purpose is to inspire a holy reverence and reliance upon that Being who is the fountain of all justice and the reservoir of all mercy, not to make converts to a particular faith by frightful denunciations of creeds, founded upon particular views. It is too commonly the practice, when inculcating the vital importance of religion in the hour of sickness, to represent the Saviour of mankind more as a God of terror than as a God of love and mercy—to present him to the mind as he sits pavilioned in clouds, rolling the thunders and flashing the lightnings of Mount Sinai; but not as he descends, shorn of his beams, and with healing on his wings, upon the holy hill of Sion. Such a course cannot be too severely deprecated. I feel assured that such ill-directed zeal (well-intentioned, I have no doubt, in all cases) frustrates the object of those who practise it. In the hour of sickness, particularly in cases where recovery is hopeless, when the mental and physical powers are prostrated by disease, the mind is peculiarly susceptible of impressions, and its powers are easily excited or depressed. Under such circumstances it is possible to effect much good in a religious point of view, provided a temperate and judicious course be adopted.* "What painter," says the author of the 'Velvet Cushion,' "who has sketched a portrait of Christ, ever thought of arming him with thunders? No; love was his weapon, and I feel sure that this is the weapon his ministers should chiefly employ. Chaucer's picture of a clergyman, and the image with which he illustrates it, delights me:—

> "He preached the Gospel rather than the law,
> And forced himself to drive, but lov'd to draw;
> —Thunder and lightning, Heaven's artillery,
> As harbingers before the Almighty fly."

"If, in the buoyancy of youth," says Dr A. T. Thomson in a recent publication,† "the majority of men neglect, if they are not really incredulous to the truth of a retributive state, under the pressure of disease it forces itself upon their notice, and the conscience too often anticipates a condemnation. In such a condition of mind nothing is more to be deprecated than holding up the terrors of an offended Deity at the side of the sick bed. It is as injurious to the mind as it is destructive to the body." The death-bed of an upright man is thus described by Jeremy Taylor:—"Then the sorrows of the sickness, and the flames of the fever, and the faintness of the consumption, do but untie the soul from its chain, and let it go forth first into liberty, and then into glory."

I was once called in to attend a man professionally who had attempted to commit suicide by cutting his throat. From the nature of the wound and other circumstances, very little hope was entertained of his final recovery. His mind for some time prior to his committing the rash act had been much depressed, and it was of great importance to keep him free from all mental excitement. Contrary to my instructions, a person connected with the ranting preachers gained access to the patient, and with several of the same persuasion engaged in prayer and conversation with the invalid. Images of a most frightful character were brought in succession before the morbidly susceptible mind of the patient, and the result was an attack of most violent convulsions. The wound was torn open, and the patient's chance of life, which was but extremely faint before, now became utterly hopeless. I feel assured that the convulsions arose from the injudicious attempt to frighten the poor man into a conviction of his depraved state; the object was well meant, but sadly misapplied. It was only by keeping the patient's mind perfectly free from excitement that I was enabled to bring him safely through the violent attack of illness consequent upon the severe wounds he had inflicted upon himself. We often see persons die of grief or despair, although their disorder, perhaps, would not have proved fatal, had they learnt to look upon death calmly and philosophically. In proportion as the mind becomes excited so does physical disease gain an undue ascendancy. Mental fortitude is, therefore, in every case of illness, to be considered as a favourable sign. In petechial fever, which is always attended by great depression of spirits, patients are found to die suddenly when any imaginary fear has obtained possession of their minds. Dr Stockar, a young Swiss physician, remarks, that when a patient wishes for death he generally recovers, as this proves the absence of all apprehension. I feel naturally inclined to say to myself, 'This patient will die,' when I see a man with an inflammatory fever, who is of an impatient, morose, and uneasy disposition; because the event of these fevers depends much on the tranquillity of the sick, and their readiness to assist nature. The greater part of acute and chronic diseases are lengthened out by the impatience of the sick, and are often rendered fatal by the transports of their minds."*

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* An able physician has remarked, that in a dangerous illness, *cæteris paribus*, a Christian would have a better chance of recovery than an unbeliever; that religious resignation was a better soothing medicine than poppy, and a better cordial than ether.

† 'Domestic Management of the Sick-room.'

Under certain circumstances much good may result from rousing the apprehensions of the patient, and pointing out to him the certainty of a future state of rewards and punishment. The following case is one in point:—A patient was brought into St Bartholomew's Hospital with strangulated hernia. The usual treatment was adopted, but reduction of the rupture was found impracticable. As the symptoms became alarming, the propriety of an operation was suggested to the patient; but he resolutely refused compliance. His alarming situation was fully explained to him, but he obstinately persisted in refusing to allow the operation to be performed. On the following day a consultation was held, and it was agreed that no alternative now remained except speedy death, unless the patient submitted to the operation; and after this was stated to the man he emphatically exclaimed, "I will rather die than submit." The surgeons and pupils were leaving the ward when they encountered Mr Abernethy. The case was explained to him, and he immediately went to the bedside of the patient, when the following conversation took place:—"They want me to have an operation performed, but I had rather die," said the man. "Well, well, my good fellow," said Abernethy, "I am sorry it is necessary; but have you thought what there is after death? There is a judgment, and you must give an account of yourself to God. God has been pleased to give us means to use, and it is our duty to use them; if you refuse to use the means God has given, and which we think may save your life, you in a measure are answerable for your death, and must account to God for this sin with your other sins." The man looked much impressed with the thought, and was silent. Mr Abernethy said, "We will leave you for a few minutes to consider the subject." On returning, the man said with great eagerness and decision, "I will submit to anything, sir." The operation was performed, and his life was preserved.†

The state of the mind during gestation ought particularly to be attended to. That the imagination of the mother has considerable influence over the health of the *fœtus in utero* there cannot be a question. It is not my intention to say anything in vindication of the absurd cases which have been narrated as facts illustrating the powerful effects of mental emotion in retarding the development of fœtal growth. The many incredulous stories which have been published on this subject have had the unfortunate effect of inducing medical men to neglect the consideration of a question of physiological and practical importance. When we call to mind the close relationship between the vascular and nervous systems, we need not be surprised that severe mental emotion should derange the physical conformation of the *fœtus*. Every excitement of mind produces an effect upon the brain and nerves, this is communicated to the vascular system, and thus the process of secretion is retarded or interfered with. In order to show the influence of the imagination of the mother on the condition of her offspring, I have only to point out to the reader the following facts:— Esquirol observes, that during the agitated periods of the French revolution, many ladies then pregnant, and whose minds were constantly on the stretch by the anxiety and alarm inseparable from the epoch in which they lived, and whose nervous systems were therefore rendered irritable in the highest degree compatible with sanity, were afterwards delivered of children whose brains and nervous systems had been similarly affected to such a degree by the state of their parents, that in future life, as children, they were subject to spasms, convulsions, and other nervous afflictions. Dr Rush also states, that during the period of the American revolution, a great number of idiotic children were born in consequence of the mental excitement into which their parents had been thrown by that event. The members of the profession have daily opportunities of witnessing the effect of mental emotion on the uterine system. How often do miscarriages arise from undue agitation of the mind. The communication of disagreeable intelligence, sudden fright, &c., are known to be the common causes of abortion. It may be laid down, then, as an indisputable axiom, that during the process of gestation the mind should be preserved in a state of great tranquillity. All irritating circumstances should be carefully avoided. The woman ought not to expose herself to the influence of causes likely to engender in her mind unpleasant ideas. She should recollect that not only her own health, but the health, and perhaps the life of her child, is dependent upon the control which she exercises over her imagination. During the process of labour how important it is that the mind should be properly regulated. After parturition has commenced, the appearance of a strange medical man has often, as if by magic, deprived the *uterus* of all power to expel its contents. Under these circumstances the woman's mind should be carefully guarded against all excitement. Her fears, if she have any, should be appeased; her humours kindly attended to, and, if innocent, gratified. Above all things the woman herself should strive her utmost to obtain a complete mastery over her own feelings, and to crush the first appearance of emotions which are likely to retard the progress of labour. She should encourage hope, dismiss all apprehensions from the mind, and resolutely determine to bear up against her sufferings like a heroine.

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* Zimmerman.

† This anecdote is related by Dr Cooke. The case came under his own observation.

It may be laid down as an axiom, that all excitement of mind is injurious to the bodily health, and if long continued, lays the seeds of disease which will sooner or later manifest itself in a tangible shape.

How many serious cases of organic disease of the heart are to be traced to ill-regulated mental emotion. Diseases of this organ are, I regret to say, alarmingly on the increase, and I much question whether the circumstance is not to be attributed to the unnatural political excitement in which the people of this country have been kept for the last few years. Intense excitement, whether from fanaticism or politics, is generally accompanied by a great increase of physical disease. Those are the happiest who cultivate ease of mind, and who studiously avoid exposing themselves to the excitement which must necessarily accompany political and religious contentions. On this subject a popular writer has justly observed, "That this happy state of mind is in a great measure within the reach of all who diligently seek after it. It does not depend upon the amount of our worldly possessions, but upon our mode of using them; not upon our ability to gratify our desires, but upon our regulation of them. They who diligently cultivate the habits necessary to attain ease of mind, place themselves almost above its disturbance. To the mortifications of disappointed ambition they are not at all exposed, and by the crosses of adverse fortune very little; whilst unavoidable afflictions in the well-constituted soften rather than sour the mind, and cannot be said to destroy its ease. Like cypresses, they throw a shade over the current, but in no way disturb its smoothness. Strict and constant discipline can insure ease of mind in poverty and privation."*

How much the passions are under the influence of the will, provided a persevering effort be made to subdue the first onset of unruly desires and emotions. A fixed and resolute determination to crush the incipient symptoms of mental perturbation will often be attended with the happiest results. Mr Walker, in his instructive and amusing work, to which I have previously referred, relates a curious circumstance connected with his own bodily health, which illustrates the power which the mind has over the physical ailments. He says, "Some months before I was born, my mother lost a favourite child by illness, owing, as she accused herself, to her own temporary absence, and that circumstance preyed upon her spirits and affected her health to such a degree, that I was brought into the world in a very weakly and wretched state. It was supposed I could not survive long, and nothing, I believe, but the greatest maternal care and tenderness preserved my life. During childhood I was very frequently and seriously ill, often thought to be dying, and once pronounced to be dead. I was ten years old before it was judged safe to trust me from home at all, and my father's wishes to place me at a public school were uniformly opposed by various medical advisers, on the ground that it would be my certain destruction. Besides continual bilious and inflammatory attacks for several years, I was grievously troubled with an affection of the trachea; and many times, after any excess in diet or exertion, or in particular states of the weather, or where there was new hay or decayed timber, my difficulty of breathing was so great that life was miserable to me. On one occasion, at Cambridge, I was obliged to send for a surgeon in the middle of the night, and he told me the next morning he thought I should have died before he could open a vein. I well recollect the relief it afforded my agony, and I only recovered by living for six weeks in a rigidly abstemious and most careful manner. During these years, and for a long time after, I felt no security of my health. At last, one day when I had shut myself up in the country, and was reading Cicero's treatise, 'De Oratore,' some passage, I forget which, suggested to me the expediency of making the improvement of my health my study. *I rose from my book, stood bolt upright, and determined to be well.*" Mr Walker then proceeds to narrate, in a number of amusing essays, how he carried his resolution into effect. The result was a complete restoration to health, which he enjoyed until a short period previous to his death. How much this *determination to be well* can accomplish, provided the patient has sufficient moral courage to adhere, in defiance of any impediment, to his resolution. There is such a thing as bidding defiance to disease. Two-thirds of the ills to which flesh is heir might have been nipped in the bud, if the principle laid down in this chapter had been acted upon.

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* The original by T. Walker, Esq.

I have in the preceding observations but cursorily developed and but faintly illustrated the important branch of the healing art, which may be termed the "Metaphysics of Medicine." Sufficient, however, has been brought forward to establish the importance of the subject. It is my hope that abler pens will be engaged in this inquiry, and that, ere long, a knowledge of the physiology of the human mind will be considered as essential to the medical student as anatomy, chemistry, and other branches which now almost exclusively occupy his attention.

CHAPTER VII.

THE WANDERINGS OF THE IMAGINATION.

How much has been written, and yet how little is known, of the disordered condition of the human understanding. The mind in its healthy and morbid condition is as yet a sealed book to the metaphysician and medical philosopher. In vain does the phrenologist endeavour to trace the connexion between the principle of thought and the delicate nervous fibres of the brain. Equally fruitless are the researches of the morbid anatomist in his attempts to discover the relationship between the physical lesions of the centre of the nervous system, and the phenomena observable in cases of impaired intellect. It is only by a careful observation of well-authenticated cases of insanity, with reference to their history, causes, and symptoms, that we shall ever arrive at anything like a correct notion of what constitutes derangement of mind. Of the precise *nature* of insanity, it is a matter of doubt whether our present amount of knowledge will be much augmented. The consciousness of our present deficiency ought, however, only to stimulate us to renewed exertions.

It is not my object in this chapter to enter into anything like a philosophical investigation of the many peculiar conditions of the mind that come under the appellation of insanity; it is only my intention to consider generally a few of those more interesting and important points connected with the subject, which are likely to be of interest to the public.

Nervous affections, including of course among them insanity, have alarmingly increased of late years in this country. The fact must be obvious to those whose situation and avocations give them an opportunity of obtaining an insight into the present condition of society. The medical profession appear conscious of the evil, and yet are fearful of admitting its existence. In hesitating to grapple with the common enemy, we allow it to obtain possession of the citadel. We are like soldiers sleeping at our posts, instead of being actively employed in watching for the first appearance of the foe. The stream is allowed to flow on until it swells into a torrent, sweeping everything away that attempts to impede its progress.

It is painful to contemplate the encroachments that this, the most terrible of human afflictions, is making among the ranks of the British aristocracy. It may be said that there is no public record of this fact; that the general and medical press are silent on the point. This may be the case; but it should be recollected that it is not in such channels that information relative to the increase of mental disease in the upper walks of life is to be obtained.

Peculiar sources of information enable me to state, as a fact, that the public is but little aware of the awful extent to which insanity has increased in England. Many causes operate in keeping the public mind ignorant of this fact. Insanity is supposed to cast a stigma, and to leave a stain on any noble or aristocratic family in which it may make its appearance; consequently they are most desirous of concealing the existence of any such ailment when it unfortunately developes itself.

The origin of the evil is to be sought for in that artificial state of society which grows necessarily out of constant advancement and civilization. We multiply our comforts, and by consequence our cares and crosses. We beat out and expand our minds, as it were, and thus create a more extended surface for impression.

In alluding to insanity and civilization advancing in the same ratio, an eloquent writer has observed, that as man emerges from the simplicity of his first estate, and comes forward into the regions of refinement, so do "the furies of disease rest upon him, and would seem to scourge him back into the paths of nature and simplicity."

The following tables fully establish the position that insanity and civilization advance side by side. The great majority of cases of derangement clearly arise from ill-regulated emotions of the mind. If we consult M. Esquirol's table, published in 1835, comprehending 1557 cases, and exclude 337 instances of hereditary insanity, it will appear that 579 cases are attributable to the excess or abuse of the passions, or to the weakness of the uneducated intellect. The following table affords a sad confirmation of the truth of these remarks:—

CITIES.	POPULATION.	NO. OF INSANE.	PROPORTION.
London - - -	1,400,000	7,000	200
Paris - - - -	890,000	4,000	222
Petersburg - - -	377.000	120	3,133
Naples - - -	370,000	479	759
Cairo - - -	330,000	14	30,714
Madrid - - -	204,000	60	3,350
Rome - - -	154,000	320	481
Milan - - -	151,000	618	242
Turin - - -	114,000	331	344
Florence - - -	80,000	236	338
Dresden - - -	70,000	150	466

(continued.)

CITIES.	POPULATION.	NO. OF INSANE.	PROPORTION.
State of New York - -	1,617,500	2 240	721
England - - -	12,700,000	16,222	783
Scotland - - -	2,093,500	3,652	563
Norway - - -	1,051,300	1,909	551
France - - -	32,000,000	32,000	1,000
Belgium - - -	3,816,000	3,763	1,014
Holland - - -	2,302,000	2,300	1,046
Italy - - -	16,789,000	1,441	4,879
Spain - - -	4,085,000	569	7,181

It is lamentable to consider the number of cases of insanity which can clearly be traced to habits of intemperance. It was correctly observed by the late Dr Uwins, that every gin shop is but a half way house between sanity and madness ; and it is into these dreadful haunts, beyond all other places and circumstances, that we are to seek for the origin of pauper insanity. An excessive indulgence in spirituous potations does not produce disease of the brain by affecting directly that organ, and thus deranging its manifestations, so much as by exciting an inflammation in the delicate villous coat of the stomach and bowels, and giving rise to chronic indigestion. Many cases of severe and incurable attacks of insanity may be clearly traced to a disordered condition of the organs of digestion acting upon the brain, so close is the relationship between the abdominal viscera and the sensorium. Into the history of the various physical causes of mental derangement it is not my purpose now to enter. The most important branch of this subject is that which relates to the early symptoms of insanity, for in proportion to our being able to detect them, are we successful in the application of remedial agents. The following symptoms are considered to indicate the existence of coming insanity. The patient manifests a sudden change in his usual habits of life ; he neglects his ordinary occupations ; his affections and temper become changed ; he manifests a restlessness, indecision, absence of mind, and love of solitude. The memory is said to be the first faculty which becomes weakened. At the beginning of an attack of insanity all objects frequently appear to be on fire. The patient hears unusual sounds—he fancies persons at a distance are speaking to him. He becomes suspicious even of those most nearly related to him. His mind is often disturbed by distressing visions during the night. The moral feelings often undergo a complete revolution. These mental signs are generally attended by physical indications, which assist the medical man in his diagnosis. Any change from the usual and ordinary habits should awaken suspicion.

In estimating the importance of an early treatment of insanity we should bear in mind the following facts. It has been noted as a general law, capable of complete demonstration, that the danger in acute diseases diminishes every day from the time of attack ; the converse, however, of this principle takes place in insanity ; for the probability of ultimate recovery lessens in a ratio to the period which is allowed to intervene between the first onset of the disease and its more advanced stages.

If we refer to established authorities on this subject, it will be clearly seen that the great portion of cures effected in cases of mental derangement take place in its early stage. Broussais, the celebrated French pathologist, speaks of his being able to arrest incipient mania with as much certainty as incipient inflammation. Dr Willis has asserted that nine cases of insanity out of ten recovered, if the patients were placed under his care within three months of the attack.* Dr Burrows has succeeded in curing 221 out of 242 recent cases. M. Andral states that the cure of insanity is all but hopeless beyond the second year. Out of 1,230 cases under this physician's care, 602 were cured in the first year, 502 in the second, and 86 in the third; and but 44 were restored to reason in the course of from three to seven years. At Bethlem and St Luke's patients that have been mad twelve months are considered as incurable. The inquiry as to the probability of recovery in the early and more advanced periods of this disease has attracted the attention of the Parisian faculty. M. Pinel read, at the National Institute of France in 1800, a memoir on this subject, in which he stated that the greatest number of recoveries from madness take place in the first month of its duration; the recoveries during the first being compared with those of succeeding months. The mean time for the duration of the disease, in cases terminating favourably, was fixed in the same document at from five to six months.

M. Esquirol says, "I have constantly observed that, in the course of the first month from the commencement of the disease, a very marked remission takes place. About that period the maniacal excitement, which had previously run its course as an acute disorder, seems to have reached its termination as such, and it is then that it passes into a chronic state, the crisis having been incomplete. This remission, which I have watched with the greatest accuracy, must be attributed to the complaints which are complicated with madness at its commencement." Insanity being invariably the result of physical disease of the brain, it is reasonable to suppose that the longer that organic lesion is allowed to remain undetected and unremoved, the probability of recovery will be lessened. It is the same with reference to the liver or stomach as to the brain. There can be no doubt that in cases of disease of the lungs and the heart, the physician often imagines that he has effected a cure when he has only succeeded in removing the more obvious symptoms, and that the seeds of disease remain and produce suffering during the remainder of the patient's life.

A person may complain of derangement of the stomach, liver, lungs, or heart, as the sequel of organic disease of these several organs, and, perhaps, little notice would be taken of his ailments, but directly the mind becomes impaired as the effect of previous acute disease of the brain, it becomes instantly a matter of observation.

"The probability of recovery in insanity," says Dr A. T. Thomson, "should be generally known; and the influence of age and sex upon that event. Recovery is more frequent than is generally supposed; the average proportion may be stated as one in two and a half, a fact sufficient to set aside the usual opinion, that a person who is mad must always remain in that state: on the contrary, when the disease is not hereditary, nor complicated with other maladies—and when the insane person is not of advanced age, nor idiotic, nor epileptic, nor paralytic—the probability is in favour of recovery. The protraction of the disease must not be regarded as positively opposing the expectation of this desirable event." M. Beaumes has recorded the case of "a lady who passed twenty-five years in a state of lunacy, within the knowledge of the whole county where she lived, and who suddenly recovered her reason." It is nevertheless true that the greater number of recoveries take place at an early period of the disease. It is also necessary to extend generally the knowledge of the fact, that the recoveries from madness are frequent and complete. The author has known instances of men in great commercial concerns, lawyers, and divines who have been mad, and yet have returned into society capable of conducting the most complicated affairs, and performing the duties of their profession as well as before they were insane. The recoveries are also in a ratio to the youth of the insane. They are more frequent in men than in women, probably owing to the same cause which renders the disease more frequent among women than among men. Among the patients admitted into Bethlem Hospital in 46 years, the proportion between the sexes was the following:—4,812 females, 4,042 males. In St Luke's, according to the report of a committee of the House of Commons in 1807, the females were one-third more numerous than the males; and in France, according to Pinel, the proportion is two to one. The statistical reports demonstrate that celibacy is favourable to insanity. According to M. Despartes, "out of 1,726 female lunatics 980 were single women, 291 were widows, 397 were married; out of 764 males, 492 were bachelors, 59 were widowers, and 202 were married. It is also a curious fact, that more persons become insane in summer than in winter."

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* *See* Evidence before Committee of the House of Commons.

In cases of insanity, the probability of recovery is lessened if the disorder be hereditary. Furious and violent derangement is more susceptible of cure than when the attacks are of a melancholic character. In insanity, conjoined with epilepsy, the diagnosis is unfavourable.

Sudden attacks of insanity are more favourable than when the disease is slowly developed. The danger of insanity is in a ratio with the habit of abstraction. Intermissions during an attack are good signs, as they establish that the brain has not undergone any serious structural alterations.

The most curious cases of insanity, and those which puzzle most the physician, both with reference to their causes and treatment, are the instances in which the imagination is deluded only upon one point, when the patient labours under monomania. The following are some curious cases of that description:—

A man who had been a drummer with a recruiting party, and had been for some time in the habit of constant intoxication, became insane. He continued in a violent and raving state about a month, during which time he had no knowledge of his situation, but supposed himself with the regiment, and was frequently under great anxiety and alarm for the loss of his drum, which he had imagined had been stolen and sold. Some medicines were given him, which he imagined were spirituous liquors, and which he swallowed with avidity. At the expiration of a month his delusion changed, and he believed himself a child, called upon the people about him as his playfellows, and appeared to recal the scenes of early life with facility and correctness. Soon after this he died.

A woman who attended too frequently on conventicals became insane. She was in a very miserable and unhappy condition, and terrified by the most alarming apprehensions for the salvation of her soul. She soon became convalescent, but a relapse took place commencing with loss of sleep. She alternately sang and cried the greatest part of the night. She conceived her inside full of the most loathsome vermin, and often felt the sensation as if they were crawling into her throat. She was suddenly seized with a strong and unconquerable desire to destroy herself; became very sensible of her malady, and said that God had inflicted this punishment on her for having (at some former part of her life) said the Lord's Prayer backwards: she continued some time in this state expecting the devil to seize her and tear her to pieces, and died suddenly.

A monomaniac under Dr Haslam, when importuned to take nourishment, said it was ridiculous to offer it to him, as he had no mouth to eat it; though forced to take it, he continued in the same opinion; and when food was put into his mouth, insisted that a wound had been made in his throat in order to force it into his stomach.

A case is recorded of a butcher, who firmly believed he saw a leg of mutton suspended from his nose. Another is told of a baker, who fancied himself butter, and refused to go into the sunshine, fearful he should melt. A painter thought he was transformed into putty, and that he could not walk without being compressed. Others have fancied themselves glass, and have refused to sit down, lest they should crack. Luther had a notion that the devil appeared to him, and had nightly conflicts with him respecting the truth of the Scriptures. Butler says, in Hudibras,

> "Did not the dev'l appear to Martin
> Luther in Germany for certain?"

Luther says he used to drive the devil away by scoffing and jeering, observing that the devil being a proud spirit, cannot bear to be contemned and scoffed. Some Popish writers affirm that Luther was the offspring of "an incubus," a kind of young devil, and that at length, when he died, he was strangled by the devil. Dr Ferriday, of Manchester, had a patient who imagined that he had swallowed the devil. Many fancy that they have frogs and serpents within them. A patient confined in the Friends' Retreat at York writes thus—"I have no soul. I have neither heart, liver, nor lungs; nor a drop of blood in my veins. My bones are all burnt to a cinder. I have no brain, and my head is sometimes as hard as iron, and sometimes as soft as a pudding." The following verses were written by a patient, and referred to the above extraordinary case:

> "A miracle, my friends, come view!
> A man (admit his own words true)
> Who lives without a soul.
> Nor liver, lungs, nor heart has he;
> Yet can sometimes as cheerful be
> As if he had the whole.
>
> His head (take his own words along)
> Now hard as any iron, yet ere long
> Is soft as any jelly.
> All burnt his sinews and his lungs;
> Of his complaint not fifty tongues
> Could find enough to tell ye.
>
> Yet he who paints his likeness here
> Has just as much himself to fear—
> He's wrong from top to toe.
> Oh friends, pray help us if ye can!
> And make us each again a man,
> That we from hence may go."

Bishop Warburton, in a note to one of his works, speaks of a man who fancied he was converted into a goose-pie. How accurate is Pope's description of the various fancies which take possession of the imagination of hypochondriacs:

> "Unnumber'd things on every side are seen,
> Of ladies changed to various forms by spleen.
> Here living tea-pots stand; one arm held out,
> One bent: the handle this, and that the spout.
> A pipkin here, like Homer's tripod, walks;
> Here sighs a jar, and there a goose-pie talks."
>
> *Rape of the Lock.*

A blacksmith in Bedlam, when asked by a gentleman how he came there, took him by the sleeve, and said, "Sir, a word in your ear. But I charge you keep it as a secret. It would cost me my life should it be known I divulged it. The world are all mad, and have locked up in this place every sober, wise man among them, and me with the rest. We pity the poor, wild madmen abroad, and would not change our conditions."

Dr J. Johnson says* he knew a gentleman whose life was rendered wretched by the number *three*. Whenever that unlucky number came across him in any conspicuous character, he was overcome with a fit of horrors, and continued so for several days, though his reason told him it was an illusion. His feelings would not, however, permit him to shake off the illusion, till, by some means or other, he contrived to break the spell, when he was as well as ever. Thus he fancied a watch which he saw hanging up in a pawnbroker's window, and purchased it. Some time afterwards, whilst winding it up, he saw to his astonishment that the number of it was 333; and, to add to his misery, the number of the pawnbroker's house was 33; while, to crown the infernal catalogues of *threes*, he remembered that he paid *three* guineas for the watch!! Ridiculous as this chain of coincidences may appear, it cost the poor gentleman more than six months of mental suffering, during which he pined away to a skeleton, and was at length obliged to travel three or four hundred miles to London, in order to find out the pawnbroker, to whom he returned the watch for two guineas. From that instant the spell was broken, and he was himself again!

A Spanish ambassador, going on a mission to Africa, lodged in his way at a convent at Navarre, where many insane people were accommodated. One person, who appeared rational, told the ambassador that his relations had unjustly shut him up there, and that their interest at court had detained him there, though he had given several proofs of a sound mind, and begged his Grace to apply to the King for his release. The ambassador pitied the man, really judging him to be ill used, and promised him to apply to his Majesty if he would tell him his name. "I am," replied the maniac, "the angel Gabriel, who carried the message from heaven to the Virgin Mary." On his progress he lodged a second time in Granada, at a monastery of the same description, and fell into discourse with one of the lunatics, whose story was that he had done eminent services to the King of Spain, and that his son, in order to take possession of his estate, had confined him among madmen; and he begged his Grace, on application to his Majesty, to obtain his release. The ambassador mentioned to him his former commission from the angel Gabriel. "Do not mind that fool, my lord, he is a liar; for if he had been the angel I should have known it, as I am God the Father himself."

The following case of derangement, which occurred during the French revolution, is related by the Viscountess Beauharnais, afterwards the Empress Josephine. The Abbé Capdeville became interested in an English orphan, eight years of age, and took him to educate. The boy (who in the account is called Tommy) was so kindly treated that he conceived a strong attachment for his benefactor. At length the Abbé was imprisoned in the Carmelites, and Tommy obtained permission to be shut up with him. One day, when the Abbé and other priests, his fellow prisoners, were at prayers in the chapel connected with the building, a mob of revolutionists broke into the place. Tommy took a station beside the kneeling Abbé, and would not remove. The ruffians having forced open the doors, and broken the windows, penetrated by several points at once; the pavement of the chapel and the steps of the sanctuary were speedily inundated with blood. Capdeville, struck immediately after the bishop, fell at his feet, and extending a mangled hand to Tommy, expired as he looked upon him. That look was a last blessing.

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* 'Medico-Chirurgical Review,' vol. xx, p. 50.

Already the poor youth, or rather child—for he was not yet sixteen—exhibited unequivocal symptoms of alienation of mind; on the death of his friend a fixed insanity appeared. The unfortunate Abbé, who had knelt apart from his companions in martyrdom, having been engaged in officiating, had fallen with his head supported upon the upper step of the altar, and his body extended across the others; the left hand was pressed against the heart, and the right, as I have already said, extended towards his pupil. The blow which had finally deprived him of life had been so rapid in its operation that death had not effaced the habitual expression of benevolence which lighted his placid countenance. He seemed to smile and slumber. By some sudden changes in the reasoning faculties, Tommy became convinced that his friend slept. Instantly, as if by enchantment, the scene of slaughter disappeared from before his vision; he knelt down by the side of the bleeding corpse, waiting its awaking. After three hours of watching, and as the sun sunk below the horizon, Tommy went to seek his harp, and again sat down beside the remains of his friend, playing melancholy airs in order to hasten his awaking, which appeared to him long in taking place. While thus employed, sleep stole over his own frame, and the charitable hands that removed from the despoilers the bodies of the martyrs, carried away Tommy, and laid him on his bed. There he remained eight-and-forty hours in a kind of lethargy, whence, however, he awoke with all the appearance of soundness of body and mind. But, if health was restored, reason had fled for ever.

In commiseration of his pious madness, a free asylum has been granted to him in this house, where he passes the day in silence till each afternoon at three o'clock. The moment that hour strikes, Tommy, who ordinarily walks slowly, runs to seek his harp, upon which, leaning against the ruins of the altar still remaining in the chapel, he plays his friend's favourite airs. The expression of his countenance on these occasions announces hope; he seems to expect a word of approbation from him whose remembrance he cherishes: this hope and this employment continue until six o'clock, when he leaves off abruptly, saying "*Not yet;* but to-morrow he will speak to his child." He then kneels down, prays fervently, rises with a sigh, and retires softly upon tip-toe, that he may not disturb the imaginary repose of his benefactor. The same affecting scene takes place day after day; and, during the intervals, the poor boy's faculties seem completely absorbed, till the fatal hour calls forth the same hopes, destined for ever to be chilled by the same disappointment.*

A young divine was one wintry day employed in snipe-shooting with a friend: in the course of their perambulations a high hedge intervened between the companions. The friend fired at a bird which unexpectedly sprung up, and lodged a part of the shot in the forehead of the clergyman; he instantly fell, and did not recover the shock for some days, so as to be deemed out of danger; when he was so it was perceived that he was mentally deranged. He was to have been married two days subsequent to that on which the accident happened; from this peculiar combination of circumstances the phenomena of the case appeared to rise, for all sanity of mind seemed to make a full stop, as it were, at this spot of the current, and he soon became a mild, pleasant chronic lunatic. All his conversation was literally confined to the business of the wedding ; out of this circle he never deviated, but dwelt upon everything relating to it with minuteness, never retreating or advancing one step further for half a century, being ideally still a young, active, expecting and happy bridegroom, chiding the tardiness of time, although it brought him gently, at the age of eighty, to his grave. This sufferer was never known to complain of heat or cold, although his window was open all the year round.

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* *Vide* 'Memoirs of the Empress Josephine,' by John S. Meures, LL.D. Harper's edit. pp. 80-93.

A young woman was seduced from her parents in early life, and carried off to London, where she lived some time. The man who persuaded her to elope with him, finding that she had no children, cruelly abandoned her. She became dreadfully depressed in spirits, and ultimately lost her senses. She was confined in a mad-house in or near the town of Dover. The narrator of the particulars of the case says, when he first saw her she was apparently about eighteen years of age. She had a pretty bouquet of flowers in her hand, and whilst she was arranging them she, like poor Ophelia, sung very sweetly snatches of various songs. On being asked why she left her late habitation, she answered, "Because I was obliged to work." She was asked how she employed her time last night. "I walked all about Dover."—"What ! did you not go to bed ?"—"No ! no ! I could not close my eyes. Give me a strong stick and a nice lantern, and I will be your watchman. Oh, I shall make a very good watchman. You must let me sleep in the day, you know." She had some slips of paper in her hand, and these she called fairings : she distributed them among the poultry in the yard, whom she emphatically styled her children. She then commenced singing, "The ocean wide," &c., and then burst out instantaneously into "Push about the joram." Finding at length her little heedless charge of fowls basking in the morning sun, she tenderly exclaimed, but in a wild accent, "My pretty children are all gone to sleep ; they have no hard-hearted lovers ;—but I can't sleep—Macbeth has murdered sleep—ah ! he was a naughty man, was he not ?"

A young man approached her, when somebody observed, "Look ! here's your lover come !"—"Oh now ! do not give me too many lovers, they will break my heart ! My fate, you know, is very hard, is it not ?"

A clergyman, about forty years of age, who was rather a weak man, happened to be drinking wine in jocular company, and by accident swallowed a part of the seal of a letter, which he had just then received ; one of his companions, seeing him alarmed, cried out in humour, "It will seal your bowels up." He became melancholy from that instant, and in a day or two refused to swallow any kind of nourishment. On being pressed to give a reason for this refusal, he replied, "He knew nothing would pass through him." A cathartic was given, which produced a great many evacuations, but he still persisted that nothing passed through him ; and though he was frightened into taking a little broth once or twice by threats, yet he soon ceased entirely to swallow anything, and died in consequence of this insane idea.

A young lady represented that she had seen an angel, who told her that she need not eat ;—after fruitless persuasions to take food, she starved herself to death. It was proposed to send an angel of a higher order to tell her, that now she must begin to eat and drink again ; but the idea was not put into execution.

Another lady imagined she heard a voice say to her one day, as she was at her toilet, "Repent, or you will be damned." From that moment she became melancholy, and this hallucination affected her more or less for a period of two years ; after which she recovered.

Mrs ——, a farmer's wife, going up stairs to dress, found the curtains of her bed drawn, and on undrawing them, she believed that she saw the corpse of her sister, who was then ill at the distance of twenty miles, and became from that time insane.

A young farmer in Warwickshire, finding his hedges broken, and the sticks carried away during the frosty season, determined to watch for the thief. He lay many cold hours under the hay-stack, and at length an old woman, like a witch in the play, approached and began to pull up the hedge. He waited until she had tied up her bundle of sticks, and then jumped suddenly from his place of concealment and seized the thief. After some altercation the old woman kneeled on the bundle of sticks, and raising her attenuated arms to heaven, beneath the bright moon then at the full, and fixing her bright eyes on the farmer, exclaimed in a sepulchral tone of voice, "Heaven grant that thou may never know again the blessing of being warm." The next day he complained of being cold, and wore an upper coat, and in a few days another, and in a fortnight he took to his bed, always exclaiming, nothing made him warm. So simple a triumph had this insane idea obtained over his imagination, that he kept his bed for twenty years, for fear of exposing himself to the cold air, and died in this condition.

It is often difficult to draw a line of demarcation between eccentricity and actual madness, or to tell where one condition of the mind ceases to exist and the other to commence. The shades of difference are frequently so imperceptible that the wisest and most experienced minds have been puzzled. We read of a man who literally was able to exclaim,

"Sun! how I hate thy beams,"

for he never would allow a particle of the sun's rays to enter his habitation. Night and day his house was illuminated with candles. He had no objection to walk by the light of the sun; but he declared into his house it should never enter. Upon all other points this eccentric being exercised a sound judgment. When reasoned with, this man admitted that his resolution was an absurd one; but he was not to be shaken from his purpose. A singular fact is connected with the history of this case:—he lost, ten years previously to the development of this eccentric notion, a favourite child by *a stroke of the sun*, and although he would not admit that this circumstance had the remotest connexion with his strange propensity, there is no doubt that they stand in relation of cause and effect. For ten years the impression caused by the melancholy death of his child remained dormant. How singularly constituted is the human mind?

Another man would never sit with his face to the fire. This eccentricity subjected him to the laughter of his friends. Whenever he entered a room in which there was a fire, he would walk in backwards, which, to persons unacquainted with his eccentric habits, had every appearance of madness.

Henri-Jules de Bourbon, the last twenty years of his life, was subject to frequent fits of hypochondriacis. In these fits he would utter the strangest things imaginable, and act in every respect like an insane person. In his last journey to Burgundy, for instance, of which he was governor, he fancied himself a hare, and ordered the bells not to be rung for fear they should frighten him, and compel him to take refuge in the woods. What was strange was, that these fits in no way deprived him of his right senses, and during them he would transact business with the same degree of attention and presence of mind as when free from their influence.

He once fancied himself a plant, and as such ordered himself to be watered. For this purpose he placed himself in the garden of the Hotel Condé, and insisted upon being watered by M. de Plarisville, one of his pages. This page, however, was unwilling to perform such a strange office, and leaving the two watering pots full of water that he had brought, made his escape, and hid himself. His royal highness was filled with indignation at the page's disobedience, and threatened worlds of mischief in retaliation. The threats, however, died away as the fancy lost its hold of his imagination.

Another delusion followed, and now the idea that he was dead possessed him; labouring under this impression, he refused all nourishment, and had it not been for a method hit upon by his valets, he certainly would have made his exit from this world from the want of proper subsistence. This is the stratagem they had recourse to: Gerard and Richard entered into his apartment, each completely enveloped in a sheet, the former under the name of the late Marshal Luxembourg, the latter under that of his highness's grandfather. After a curious conversation, the topic of which was the country of the dead, the valets invited him to partake of a dinner at Marshal Turenne's, to whose house they were going. The prince appeared surprised at the proposition, and expressed his doubt whether the dead ever ate. The fact that they did eat having been satisfactorily proved to him, he followed his servants through a subterranean passage, in which they met the *soi disant* Marshal Turenne. This strange assemblage of men sat down, and all partook largely of the food before them, and none more than the already half-famished Prince of Bourbon. The waiters, who were all shrouded in sheets, acted their part remarkably well; and, as long as this strange fancy of their master continued, officiated under the same circumstances.

One of the most frequently recurring of his mental delusions was the belief that he was a bat, and he actually caused a room to be hung with stuff, and wadded, for fear he should fly against the boards in the day-time, and do himself some injury.

He grew, at last, weaker and weaker every day, and it was evident that his remaining days were few. The princess, his wife, who was of a serious and devout turn of mind, suggested the propriety of his seeing the Curé of St Sulpice, but it was out of the question; he repelled all attempts. At last, one evening in winter, at five o'clock, he ordered one of his servants to get a fly; it was no use remonstrating with him, that he had several horses and carriages to command; a fly he would have. The vehicle was brought to the door—he threw himself into it, and, forbidding any of his attendants to follow, he ordered the coachman to drive with the utmost speed. The princess, however, who had heard of the intention of her husband, despatched two or three servants after the coach; the speed at which the animal was urged precluded all possibility of their keeping it in sight, so they were obliged to return as ignorant as they were on their setting out. Henri-Jules first had himself conveyed to the Bastile, into which he did not go; then to the Temple, and from thence to the Fathers of the Oratory, where he applied for an audience with the principal.

The brother who opened the gate, seeing a person so strangely habited (for so, by the bye, he was), gave the prince to understand that it was too late to see the principal, who, besides, was holding a consultation with a bishop. His royal highness, however, insisting, the brother bade him wait in the hall till such time as his superior would be disengaged. To this Henri-Jules consented; and, notwithstanding the severity of the cold, stood there not less than an hour. At length the superior was at liberty, and not little was his astonishment to see the prince in the hall, waiting like a menial. After the necessary excuses and apologies, they sat down by the fire, and talked till eleven o'clock at night, at which hour the prince returned home. He ordered supper to be brought in, and shortly after contracted the fever which was the cause of his death. An hour before his dissolution he ordered a couple of stout sticks to be brought to him. At a loss to imagine what he would want sticks for at such an awful moment, they were tremblingly brought to him, when, having caused them to be placed on either side of him on the bed, he called for the princess and Mademoiselle de Langeron. These ladies being apprised of his royal highness's wish to see them (not, however, without being first warned to beware of the two sticks), with doubtful feelings made their appearance. When the prince saw them, he said, that, considering the shameful way in which he had treated them during his lifetime, he deserved that they should retaliate on him, and begged they would make him die under the blows they would minister to him with the two sticks. The poor prince, however, was saved such a death, and died before he could persuade his wife to take one of the sticks.

It has been recorded of Hogarth, that, having got a new carriage, he went in it to the Mansion House for the purpose of paying the Lord Mayor a visit. On leaving the house, he went out by a different door from that by which he entered, and found that it rained hard. Notwithstanding this, he walked homewards, and reached his own dwelling drenched to the skin. His wife, seeing him in this state, asked him how it had happened, and what had become of his carriage? The truth was, that he had utterly forgotten the circumstance of having gone in a carriage, or having one at all.

There are few who have paid any attention to the finance of the country but must have heard of Dr Robert Hamilton's 'Essay on the National Debt,' which fell upon the Houses of Parliament like a bomb shell, or rather which rose and illuminated their darkness like an orient sun. There are other writings of his in which one knows not which most to admire—the profound and accurate science, the beautiful arrangement, or clear expression. Yet, in public, the man was a shadow; pulled off his hat to his own wife in the streets, and apologised for not having the pleasure of her acquaintance; went to his classes in the college on the dark mornings with one of his wife's white stockings on the one leg, and one of his own black ones on the other; often spent the whole time of the meeting in moving from the table the hats of the students, which they as constantly returned; sometimes invited them to call on him, and then fined them for coming to insult him.

He would run against a cow in the road, turn round and beg her pardon, "madam," and hope that she was not much hurt. At other times he would run against posts, and chide them for not getting out of the way, and yet his conversation at the same time, if anybody happened to be with him, was perfect logic and perfect music.

A volume might be written filled with anecdotes of this amiable and excellent man, all tending to prove how wide the distinction is between first-rate thought and that merely animal use of the organs of sense which prevents ungifted mortals from walking into wells.

The fish market at Aberdeen, if still where it used to be, is near the Dee, and has a stream passing through it that falls into that river. The fishwomen expose their wares in large baskets. The doctor one day marched into that place, where his attention was attracted by a curiously figured stone in a stack of chimneys. He advanced towards it till he was interrupted by one of the benches, from which, however, he tumbled one of the baskets into the stream, which was bearing the fish to their native element. The visage of the lady was instantly in lightning, and her voice in thunder ; but the object of her wrath was deaf to the loveless sounds, and blind to the most alarming colours. She stamped, gesticulated, scolded, brought a crowd that filled the place, but the philosopher turned not from his eager gaze and his inward meditations on the stone. While the woman's breath held good she did not seem to heed, but when that began to fail, and the violence of the act moved not one muscle of the object, her rage felt no bounds ; she seized him by the breast, yelling, in an effort of despair, "Spagh ta ma, or I'll burst," sunk down among the remnant of her fish in a state of complete exhaustion, and before she had recovered the doctor's reverie was over, and he had taken his departure.*

Dr Macnish relates many amusing instances of eccentricity. He mentions the case of the Rev. George Harvest, one of the ministers of Thames Ditton, whose ideas were so often confused that he would write a letter to one person, address it to a second, and send it to a third. He was once on the eve of being married to the bishop's daughter, when, having gone a gudgeon fishing, he forgot the circumstance, and overstaid the canonical hour, which so offended the lady that she indignantly broke off the match. If a beggar happened to take off his hat to him in the street, in hopes of receiving arms, he would make him a bow, tell him he was his most humble servant, and walk on. He has been known on Sunday to forget the days on which he was to officiate, and would walk into church with his gun under his arm, to ascertain what the people wanted there. Once, when he was playing at backgammon, he poured out a glass of wine, and, it being his turn to throw, having the box in one hand and the glass in the other, and being extremely dry, and unwilling to lose any time, he swallowed down both the dice, and discharged the wine upon the dice-board. At another time, in one of his absent fits, he mistook his friend's house, and went into another's, the door of which happened to stand open ; and no servant being in the way, he rambled all over the house, till, coming into the middle room, where there was an old lady ill of the quinsey, he stumbled over the night stool, threw a clothes horse down, and so alarmed the patient that she vociferated most loudly for assistance. When the servants came into the room, and found Dr Harvest lying prostrate on the floor in a most ludicrous position, the lady was so excited with immoderate laughter that the quinsey broke in her throat and she recovered.

Eccentricity is seen every day, and therefore it passes without observation ; but eccentricity is but one form of mental derangement. The difference between eccentricity and monomaniasm is merely a difference of degree ; and any other difference, than in extent, between monomaniasm and confirmed madness, it were difficult to specify. *Nemo mortalium omnibus horis sapit* loses nothing of its force by being an old hacknied sentiment ; and could we persuade the world that mental derangement, in some form or degree, is universal, the outcast and deserted lunatic would stand a better chance of recovery, or of receiving better treatment should he not recover.

Many persons, although conscious of mental infirmity, are most anxious to conceal its existence from others. Where the suspicion of madness attaches itself to any one, it is very likely to aggravate the malady so as to produce it in cases where the nervous system is exquisitely developed. A gentleman who had been exposed to great mental excitement, felt a degree of mental uneasiness which he fancied was incompatible with long-continued mental soundness. He very prudently consulted a physician, who, perceiving the state of his mind, advised an immediate abstraction from all business, and a temporary sojourn in the country. As this advice was considered to be good, it was adopted. During his absence from town he received a letter from a friend to whom he had revealed the state of his feelings previously to his availing himself of professional assistance, in which he imprudently informed him that his family was aware of his having been labouring under temporary mental derangement; and although at the moment he was happily on the eve of recovery, the idea that his relations knew that he had consulted a physician on the state of his mind had so powerful an effect upon him, that violent maniacal excitement was produced, and in this state he remained some months, but was eventually cured.

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* 'New Monthly Magazine,' vol. xxviii, p. 510.

The amiable daughter of a once respectable tradesman in the city, now dead, became at the age of twenty-three insane. She was naturally of a sprightly disposition, endowed with great sensibility, an excellent understanding, and most affectionate heart: becoming very unmanageable, her relatives sent her to an asylum in a neighbouring county. During a long residence she became convalescent, after a few well-marked lucid intervals, in which she grieved excessively on discovering her situation. One day two old school-fellows were accidentally viewing the receptacle of multiplied misery, with an attendant in waiting, as a matter of mere travelling curiosity (which, it is proper to notice, is a very reprehensible practice) not knowing she was there. Upon entering a common sitting-room, the invalid was discovered sewing; when, lifting her eyes from her work, she fixed them most earnestly on the visitors, screamed, sprang from her chair, rushed into the arms of the foremost, and exclaimed, "Ah, my dear, dear S——, *you* see me here!" and at intervals screaming and sobbing, reiterated the words, adding, "in this place, in this figure," &c. As soon as her arms could be disengaged, she was removed to her own apartment, from whence she has scarce ever emerged, although upwards of ten years have succeeded the heart-rending scene.

It is a fallacy to suppose that insane persons are completely deprived of all reasoning powers. I have often conversed with patients who have been conscious of their infirmity, and who have bitterly lamented it, and while evidently insane have been capable of pursuing a correct process of ratiocination. Lunatics often exhibit a great acuteness of intellect, which astonishes those ignorant of the peculiarities of mental alienation.

A gentleman calling to see a maniac, said to the keeper in his hearing, "Does he know me, sir?" The keeper answered—"Yes, sir, he knows everybody;" upon which the maniac set up a loud laugh. "What do you laugh at?" said the keeper. "Why, said he, "I don't know everybody, but I know all those I had used to know."

A physician having once made a change in a medicine, was particular in his inquiries as to its operating. He overheard the patient say, "Damn him, he wants to make experiments upon me, that he may know how to cure mad folks."

The same gentleman having once a patient so furious that no barber durst go near him, and his beard adding to the horror of his looks, having worn it several weeks, he was determined to shave him himself. After having made him fast for the purpose, he expressed a doubt whether he should be able to perform the operation, having, he said, never attempted to shave any one but himself. "Why, thou fool," said the maniac, "if thou can'st shave thyself thou may'st certainly shave me, now I am made fast hand and foot, and my head too; but take care I don't bite thee."

A maniac repeating the question, "What brought me to this?" was answered without thought, "Your pride, sir." "I shall never," says the relater, "forget his look of intelligence while he spoke as follows: 'Give me your hand, my good sir; I have said that you must be mad for keeping me chained in this manner; but I was mistaken—you are a wise and understanding man—for if pride be my complaint, you have taken a most excellent way to cure me; these chains, strait waistcoat, this dark room, low keep, and medicine, will cure pride, I'll warrant.'"

The moral treatment of insanity is a subject which has of late attracted much observation. In former times the poor lunatics were confined in iron cages, and considered as little better than wild beasts or demons. The greatest cruelties were practised in mad-houses. The patients were chained to walls, and whenever they exhibited symptoms of violence they were subjected to severe corporal punishment. The system of treatment now pursued is of a very different character. The disordered mind is won back to health by means of kindness. The patients are considered human beings, and treated as such.

A very strong argument in favour of the kind treatment of the insane may be deduced from the fact, that many patients find their way into lunatic asylums who have no right to be incarcerated. According to the present system any two legally qualified medical men, by signing a certificate, may consign a fellow creature to a mad-house. This never ought to be the case. How difficult it is for those whose lives have been devoted to the study of mental aberration to detect its presence in certain cases, and how much more difficult must it be for the apothecary or surgeon, who may, perhaps, never have seen a case of insanity, to give an opinion on the subject. I will venture to say that not one practitioner out of one hundred ever had a case of insanity under his care, or made the diseases of the mind his study, and yet a certificate, with the names of any two physicians, surgeons, or apothecaries attached to it, is sufficient to warrant any two or three keepers forcibly dragging a person in the perfect possession of his senses to some snug retreat. How many who are merely labouring under temporary mental excitement, not the most remotely allied to insanity, are considered as mad, and are shut up in lunatic asylums! The man whose habits are merely eccentric, whose passions are easily roused, is often pronounced insane, and is doomed to pine away his existence among men unquestionably mad. It is an easy and effectual mode of getting rid of a troublesome relative to send him to an "Establishment for the reception of the nervously afflicted," as a mad-house is often termed in an attractive advertisement. It may be said that this never happens. I reply, it has occurred, and as long as the present "certificate system" is put in practice, the same outrage on humanity will often take place. The utmost vigilance and kindness exhibited by the commissioners appointed by the Lord Chancellor to visit the receptacles for the insane will not remedy the evil. It is impossible that every case can be investigated. How often have I been implored by lunatics, in the most persuasive and touching language, to interest myself in obtaining their release from the place in which they were confined. I have frequently been addressed by the inmates of a lunatic asylum to the following effect:—"Dear sir, I am not mad, my relatives have confined me here against my consent. I wish to be released from this horrible place; pray do kindly consider my case; I assure you I am quite well. I cannot bear to associate with these mad people." Repeatedly have persons confined in asylums spoken to me in the above strain, and I have been told that madmen seldom admit that they are insane, and that the appeal made to us is a strong evidence of insanity. I am willing to admit that many, unquestionably insane, will often complain with great earnestness and bitterness of cruelty and injustice in confining them in mad-houses, but how often do sane persons, imprisoned in a lunatic asylum, make the same assertion, it being considered to be deserving only of a passing observation. It often happens that patients obstinately refuse to take proper nourishment. They may imagine the food either to be poisoned, unwholesome, or part of a human being. The delusions of some lunatics may lead them to suppose that they are commanded by an angel to refrain from gratifying their appetite. Under these circumstances, the "forcing" system is put in practice. The patient is seized by two or three keepers and bound down on a bed ; the mouth is then forcibly opened and the food pushed down the throat. The lunatic often struggles violently, and in resisting the endeavours of the keepers to introduce nourishment into the stomach, a patient's teeth have been known to be broken or pulled out of their sockets, and in one case on record, the handle of a silver spoon was forced through the roof of the mouth.* Death often takes place under these circumstances, either from suffocation, or dislocation of the vertebræ of the neck. In order to perform the "forcing" operation effectually the patient's head is unavoidably bent backwards, and his throat is strongly grasped, so that he stands a good chance of dying from one of the two accidents mentioned.

A gentleman confined in an asylum refused his food. He was bound down by the keepers, who forced him to take it. The patient resisted, and called for assistance in the following most piteous words: "For God's sake, Mr ——, come and help me, or I shall be killed by this man." No entreaties, either on the part of the sufferer, or the servants, could induce Mr ——, who was seated in an adjoining room and within hearing of the scuffle, to interfere. At last all became suddenly still, and the keeper quietly reported to Mr ——, that the gentleman went off in a fit during the act of forcing, and no further notice was taken of the matter.† That in a Christian land such barbarities should be practised is indeed appalling to consider. We do not mean to deny that it is not necessary, in particular cases, to compel the refractory to swallow food ; but when this disagreeable alternative is indispensable, the utmost kindness should be manifested. We should never forget that we are dealing with human beings, with men having the image of Deity stamped upon them, and not with brutes. We have seen this operation performed, and have expostulated with the keepers on the cruelty of their conduct. On one occasion a delicate young woman, who had refused to eat, was about to be prepared for being "forced." Judging from the depression of her countenance, she appeared to have a consciousness of what she was about to undergo. We begged the keeper to expostulate with her, and, after five minutes' conversation, she consented willingly to eat her food, and thus a disgusting and painful process was avoided.

I feel conscious, in the preceding observations, that I have but approached the confines of this deeply interesting and important subject. On some future occasion it is my purpose to enter more fully into the question of the treatment of the insane, when I shall bring before the public details of scenes which I have witnessed within the walls of madhouses fraught with the most important instructive lessons.

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[*] 'First Report of Committee on Madhouses,' 1816, pp. 2 and 80.

[†] 'First Report of Committee, 1816,' p. 86.

CHAPTER VIII.

DIET AND DIETETICS.

Before any correct notion can be formed as to the nature of the food best calculated to nourish the system, it will be necessary to consider of what the body is itself composed. The constitution of the body is of a compound character, and consists of certain proportions of solids and fluids in different states of combination; the principal of which are water, and certain animal substances termed fibrin, albumen, gelatin, mucus, and osmazome. The elementary matters of which these are composed are constantly being thrown off from the system, but in a state of combination different from that in which they existed as a part of the body. The elementary matters which escape from the system at the various outlets are carbon, azote, hydrogen, oxygen, phosphorus, and lime. This constant waste must be replaced, either by the atmosphere which we breathe, or by the food, either solid or liquid, which we take into the system. The atmosphere is composed of certain proportions of oxygen and azotic gases, but it is questionable whether the air is absorbed and converted into any part of our bodies. It is, then, upon what is taken into the stomach that we must depend for matter to supply the waste which the system is constantly undergoing. Every species of food, before it can afford any nourishment to the system, must contain the elementary matters enumerated; but it is not indispensable that they should exist in the same state of combination. The organs of digestion convert the food taken, into a substance assimilated to our nature. The closer approximation the aliment introduced into the stomach makes to carbon, oxygen, azote, hydrogen, phosphorus, &c., the less necessity is there for the digestive functions to exert themselves. The digestibility of our food will be in a ratio to its containing these elementary matters in a simple uncombined state. On this account, animal substances are more easy of digestion than vegetable products, and vegetable products than inorganic bodies. The process of digestion is exceedingly simple: the food, after being masticated, enters the stomach mixed with the salivary fluid, where it is converted by the gastric juice—a peculiar fluid secreted in the stomach—into a substance termed *chyme*. The food, thus converted, passes into the alimentary canal, and in the duodenum it is mixed with the bile and other fluids, and is formed into a milky compound called *chyle*. The nutritious part is here separated from the useless matter, and the former is absorbed by a number of minute vessels termed *lacteals*, which terminate in the *thoracic-duct*, and is conveyed by it into the blood from which fluid, bone, muscle, fat, and every component part of the body are secreted. Condiments contain none of the elementary matters mentioned, but they act as stimulants to the organs of digestion, and are thus of essential service. The materials for the support of the system are derived from the mineral, animal, and vegetable kingdoms. From the first are derived water and lime ; from the second carbon and hydrogen ; and from the third azote. The animal kingdom, besides azote, contains a portion of the other elements. M. Majendie instituted a series of interesting experiments with the view of ascertaining whether animals could live upon food which contained no azote. For this purpose he fed dogs upon sugar, gum, butter, and olive oil, substances which do not contain azote. This distinguished physiologist found that animals fed upon such food pined away and ultimately died.

The following were the conclusions to which Majendie arrived :—

1. That animals derive the azote which enters into their composition entirely from their food, and hence, that no animal can live for a considerable time upon food totally destitute of azote.

2. That animals, even those naturally carnivorous, can live to a certain time upon food entirely destitute of azote ; in consequence of which, their excretions become altered, and throw off less azote than when fed on animal food, acquiring the properties which these excretions have in animals whose food contains a small proportion of azote.

3. That vegetable and animal substances, destitute of azote, are highly nutritious, provided at the same time azote be supplied from the admixture of some other aliment containing it, although in small proportion. Upon these principles, alimentary substances are divided into three great classes. 1. Those which contain azote, carbon, hydrogen, and oxygen. 2. Those which contain carbon, hydrogen, and oxygen. 3. Those which contain neither carbon nor azote.

The following substances are contained in the first division. Fibrin, albumen, gelatin, mucus, osmazome, gluten ; second class—starch, gum or mucilage, sugar, oil, and fat ; third division contains water, various earths, sea salt, &c. The three principal alimentary substances are the saccharine, the oleaginous, and albuminous, which are represented by sugar, butter, and the white of eggs.

FIBRIN is very nutritious. The great mass of the solid matter of the muscles of animals is composed of it.

ALBUMEN is contained in the white of eggs, cartilage, horn, hair, nails, blood, brain, oysters, mussels, and snails. Albumen uncoagulated is highly nutritious and easy of digestion.

GELATIN forms the principal constituent of bones, ligaments, tendons, membranes, skin, and muscles. It is nutritious, and easy of digestion.

MUCUS exists in the saliva and in most of the secretions.

OSMAZOME is found principally in fibrous organs. The flesh of game and old animals contain a large portion.

GLUTEN exists in the vegetable kingdom, in all farinaceous seeds, wheat, flour, fruits, roots, leaves of cabbages, &c.

The following belong to the second division :—

Starch is principally discovered in the vegetable kingdom, in farinaceous grains, rice, barley, maize, &c. &c.

Gum or Mucilage.—The former is a vegetable product, and is furnished by many trees, particularly the various species of mimosa. The latter is derived from esculent vegetables.

Sugar is extracted from the sugar cane, maple tree, beet-root, &c., and is very nutritious.

Oil and Fat are also highly nutritious.

I have now briefly to consider the third division, and this consists of water, earths, and sea salt. Of the first little requires to be said. The earths are more nutritious than is commonly supposed ; many instances are on record which establish that it is possible for whole tribes to live for a considerable time upon nothing but earthy matter. Humboldt has given an account of a whole nation of earth-eaters. The Tungusses eat a fine clay with reindeer's milk. Salt is an indispensable part of food.

Having said so much with reference to the elementary principles of all alimentary substances, it is now my purpose to consider generally the rules which ought to guide us in the selection of food. Of the importance of attending to the regulation of diet all must be familiar. How much do our personal comfort and happiness depend upon a proper attention to diet? The Egyptians thought so much depended on the quantity as well as quality of the food, that they dieted their kings, and prescribed by law the nature and proportions of their aliment.

Before entering upon the consideration of any other subject, let me discuss briefly the question, whether vegetable and animal diet is the natural diet of man. The learned world has been amusing itself for ages in discussing the question, as to whether man is herbivorous, omnivorous, or carnivorous in his nature—whether man should feed on animal or vegetable substances. Without entering into a consideration of the question whether animal food was eaten before the Deluge, I have no hesitation in asserting that it is sufficiently evident, from the structure of our teeth, and from the complicated organization of our digestive apparatus, that man's nature is essentially omnivorous, and capable of subsisting on aliment of every description. There is no doubt that the idea of vegetable diet being natural to man originated in many countries from the notion it was wrong and unlawful to deprive animals of life.

I do not deny that there are many instances recorded of persons who have promoted their health and prolonged the duration of their lives by abstaining from animal food, but these are but exceptions to the general rule, and no principle deduced from their consideration would be applicable to mankind generally. Much of course must depend upon the nature of the climate in which a person lives. In hot countries the inhabitants are instinctively led to prefer vegetable food, and we accordingly find that the residents in tropical climates select a diet of this description. The Bramins of India, and the inhabitants of the Canary islands and the Brazils live almost entirely on herbage, grains, and roots, whilst the inhabitants of the northern latitudes, where vegetation is necessarily stinted by the cold, live almost exclusively upon animal food. That a diet purely vegetable is, under certain circumstances, compatible with sound health and a prolonged state of existence, may be reasonably inferred from the following fact mentioned by Mr Lawrence. He says—"I was myself acquainted with a lady who, from a kind of whim, began to live on vegetables. She was in good health, and it was not necessary at all for her to give up her ordinary habits of life. She took a fancy, however, to live in this way. She took nothing but distilled water, fruit, and vegetables, without tasting animal substance, except the milk she took in her tea, for several years. I never knew a more active person; she made nothing of walking ten miles, and could walk with ease twenty. She had two children during the time I knew her, and suckled them for about twelve months each, during which time she only took what I have mentioned—vegetables and fruit to eat, and distilled water to drink—taking nothing stronger than tea, or tea mixed with milk; yet they were fine, healthy children."

The character of the mind has, during all ages, been supposed to be considerably under the influence of the diet. Hippocrates, in his 'Treatise on Diet,' endeavours to establish that all men are born with the same amount of mental capacity, and that the difference which, in after-life, is discoverable in the minds of the human race, is altogether to be attributed to the food which they have eaten. A diet purely animal is said to give vigour and energy to the mind, as well as strength to the body. This was the notion of Prior, who, in the 'Alma,' asks—

> "Was ever Tartar fierce or cruel
> Upon the strength of water-gruel?—
> But who shall stand his raging force
> When first he rides, then eats his horse?"

Fuseli, the painter, was in the habit of eating raw meat for the purpose of engendering in his imagination horrible fancies; and it is related of Mrs Radcliffe that, when she was writing the 'Mysteries of Udolpho,' she ate uncooked meat for the same object. Whether the desired effect was produced I cannot say. The ancients had some absurd notions on this subject. With the view of making Achilles a hero, he was fed on the marrow of lions.* There can be no doubt but that an abstinence from animal food would, to a certain extent, impair the energy of the mind by weakening the body generally. Those who have to undergo much bodily and mental fatigue, require a substantial and generous diet. Much will, however, depend upon constitutional peculiarities. To lay down the general rule that animal food can be abstained from with impunity is extremely absurd. It will be found that the majority of the eating portion of the creation will willingly assent to the following epigram:—

> "'Abstain from flesh!' Richardus cries,
> ''Twill make you candid, just, and wise;'
> Just, candid, wise!—Pythagorean,
> Feed *thou* on *pulse—roast beef* feed *we* on!"

Those who are compelled by their avocations to take much physical exercise, and to work laboriously, require a large amount of animal food. Persons who spend much time in the open air on horseback, generally eat enormously. The natives of the Pampas, who almost live upon the saddle and ride great distances, are in the habit of eating what is called jerked beef, which consists of the muscular parts of cows or oxen, which, after being cut into thin slips, are dried in the sun. This is said to form a highly nutritious kind of food. Captain Head found that he could undergo the most surprising fatigue whilst living upon dry beef and water alone. Persons who perform night duty require a liberal diet. The more a person sleeps the less food he requires. Sailors and soldiers, who are often compelled to be up during the greater part of the night, require an extra allowance of food and drink. Captain Parry found it necessary to increase the allowance of food during that arduous period of his expedition when the men had scarcely any sleep for many days in succession.

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* Prince Maurice of Nassau said that the English fought bravely because they had a piece of beef in their stomachs.

Mr Mott, in the 'Report of the Poor Law Commissioners for 1836,' says that the following scale may be considered a fair estimate of the proportion of food requisite to support human life in a sound and healthy state :—" 1st. For a person of moderate health and constitution, but using little exercise or exertion, daily allowance of food, 12oz. to 18oz. ; in nutritive matter equal to an average daily of 10oz. 2nd. For persons of good health, accustomed to moderate labour, as sailors and soldiers on ordinary peace duty, or agricultural labourers, or mechanics at their usual work, daily allowance of food 18oz. to 24oz. ; in nutritive matter equal to an average daily of 16oz. 3rd. For persons subject to hard labour, or other violent exertion, in good bodily health, 24oz. to 30oz. of food ; equal to 22oz. of nutritive matter."

Many facts establish the fallacy of the notion that a diet consisting of vegetables produces not only greater clearness of intellect but long life. M. Peron proved by experiment that persons living upon a mixed diet, and using a large portion of animal food, are stronger than those who support themselves on vegetables. He selected seventeen Frenchmen, fourteen Englishmen, fifty-six men of the island of Timor, seventeen New Hollanders, and twelve natives of Van Diemen's Land. The men from the three latter countries lived chiefly on vegetables. Having tested their respective strength, M. Peron gives the mean results in each case. It appears, that in point of strength, the English rank first, next the French, then the inhabitants of Timor, and lastly the men of New Holland and Van Diemen's Land. Great abstinence will no doubt weaken the faculties of both mind and body. Men who, in the earlier ages, from mistaken notions on religion, confined their diet to a few figs and a crust of bread and a little water, were so many gloomy enthusiasts ; and there is little doubt but that the excessive abstinence to which the Carthusians and some other religious orders were subjected, is one of the greatest sources of modern superstition.

A variety of circumstances in addition to those previously enumerated, force upon the mind a conviction of the truth, that a *mixed* is the most natural diet for man. Dr Wollaston, a celebrated scientific physician of his day, has observed, with reference to this subject, that persons who live exclusively upon animal food are liable to calculous affections ; a large quantity of *lithic acid* is secreted, and this lays the foundation of those distressing and painful disorders to which I have alluded. Whilst, however, advocating for persons in the enjoyment of health, a diet composed of a due proportion of animal and vegetable matter, it is not my purpose to question the beneficial influence which simplicity of diet is known to exercise upon the physical functions. Simplicity of diet certainly has the effect of rendering the mind more clear in its operations. Even the senses become more acute when the diet is attended to. It is recorded, that a boy found in a forest possessed so acute a sense of smell, from the simplicity of his diet, that he was able to distinguish by it poisonous plants from innocuous ones ; but this delicacy soon wore off when he lived like other men. Carneades, previous to his disputing with the sect of philosophers opposed to him, abstained from much food, and took several doses of hellebore. This had the effect of rendering his faculties more vigorous and his imagination active. During the seven years in which Protogenes was engaged on the picture of Jalysus, his diet consisted wholly of lupines and a little water. This light diet gave great freedom and delicacy to his fancy. We are informed by Philo, that the Therapeutists were not permitted to eat before the sun went down, in order to enable them the better to search after wisdom. Mr Law, the celebrated financier, in his younger days, used to eat only a little bit of chicken once a day, in order that he might be more successful at play. During the time that Sir Isaac Newton was composing his treatise on colours, he abstained entirely from animal food, eating only a little biscuit and a glass of white wine per diem.

That more diseases arise from over-feeding among the wealthy than from the opposite cause, excessive abstemiousness, there cannot be a doubt.

> " Fast and fear not, you'll need no drop or pill :
> Hunger *may* starve—excess is *sure* to kill."

It was an observation of Dr Hunter, that most people live above *par*, and this circumstance rendered the generality of diseases and accidents more difficult of cure. A celebrated physician inquiring of a person who was remarkable for the health which he enjoyed at an advanced period of his life, what regimen he followed, was answered, " I make but one meal a day."—" Keep your secret," said the doctor ; " if you publish it to the world you will utterly ruin the practice of medicine." Baron Maseres, who lived to the age of 90, and who never stood in need of medical advice, went one day in every week without dinner, eating only a round of dry toast at tea.

Dr Franklin is said to have lived upon bread and water for a fortnight, and got stout and healthy on the diet. Dr Gower, of Chelmsford, had a patient who lived for ten years on a pint of tea daily, now and then chewing half a dozen almonds, but not swallowing them. Mr Wood was told by a physician that he knew a gentleman who never tasted fish, flesh, or fowl, but who lived upon bread and milk. He was once travelling, and being very hungry, he was induced to eat a small piece of chicken, and the consequence was he immediately fainted away. The younger daughter of Frederick, King of Naples, never could eat animal food. If she did so, violent and long-continued syncope succeeded.* The late Duke of Portland broke a blood vessel, and by the advice of Dr Warren, his physician, he entirely changed his system of diet. He lived for six weeks on bread and water. During the whole of his subsequent life he entirely abstained from wine and malt liquor, and ate very moderately. The monks of Monte Santo never taste animal food ; they subsist on vegetables, olives, and cheese. Dr Hecquet, of Paris, who lived to a very advanced age, touched neither meat nor wine for thirty years. It is stated by Hasselquist, in his travels in the Levant, that " above a thousand Abyssinians, who were destitute of provisions on a journey to Cairo, lived for two months on gum arabic ; and arrived at Cairo without any unusual sickness or mortality."

I must now refer to the rules to be adopted with reference to our principal meals. First as to breakfast. Persons in good health generally eat heartily at this meal. In former days the breakfast was almost as substantial as the dinner, and various kinds of cooked meats and good strong ale were invariably seen at the morning repast. Those who dine late ought to eat liberally at breakfast. A small portion of meat or eggs taken in the morning may do away with the necessity for luncheon. Dr Paris has found barley-water a good substitute for tea in cases where acidity exists. In this affection, all new bread, hot toast and butter, hot muffins, and new rolls must be carefully avoided. Slight exercises before breakfast will be found to give tone to the digestive organs ; but too much exercise will not only destroy all inclination for food, but weaken the powers of digestion.

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* Turner's ' History of Remarkable Providences.'

Dinner.—As this is by far the most important meal of the day, and one to which the epicure, *gourmand*, and *bon-vivant* pay the most attention, it is deserving of particular consideration. First, as to the time of dining. The Romans never considered this as a meal. Their dinner was more like the modern luncheon, and was only indulged in for the purpose of preventing the faintness that might result from long abstinence. In the days of Elizabeth, the nobility generally dined at eleven, and supped at five or six. It has been humorously said, with reference to the modern system of late hours,—

"The gentleman who dines the latest
Is in these days esteemed the greatest;
But surely greater than them all
Is he who never dines at all."*

It is difficult to lay down any rule on this point which would be universally applicable. Much must depend upon the health, habits, and peculiar occupation of each individual. For myself, I must confess I dislike the very early and the very late dinners. To dine at two or three is to destroy the whole of the day. Neither the mind nor the body is fit for much exertion immediately after eating a hearty meal. They both require rest, and must have it, if the digestion is not to be impeded. The best hour for dining, *cæteris paribus*, is between five and six. Invalids of course require an early dinner. Persons, also, advanced in life, who eat sparingly, ought to dine at two or half-past. The same holds true with regard to children. Persons engaged in active business during the day should take a light luncheon about twelve o'clock, particularly if they have breakfasted at an early hour. With reference to the quality of the dinner, I am not an advocate for what is termed high living, under any conditions of bodily health.

"Old Lucullus, they say,
Forty cooks had each day;
  And Vitellius's meals cost a million:
But I like what is good,
When and where be my food,
  In a chop-house or royal pavilion.

"At all feasts (if enough)
I most heartily stuff,
  And a song at my heart alike rushes;
Though I've not fed my lungs
Upon nightingale's tongues,
  Nor the brains of goldfinches and thrushes."

I must, however, confess my *penchant* for the French and Italian style of dinner, and notwithstanding the many sauces and the variety of modes in which the good things of this life are served on the table, I do not think, if moderation be exercised, that the digestive functions are much in danger of being impaired by dining daily at *Perigord's* or *Verey's*, in the Palais Royal. In dining at the *Café de Paris*, it is not necessary that every dish mentioned in the *carte* should be eaten or tasted. An Englishman visiting Paris dined at a celebrated *restaurateur's;* the bill of fare was presented to him, and when he saw 190 dishes enumerated, he exclaimed to the waiter, that he had made a mistake. "I asked," he said, "for the bill of fare, and you have brought me a bill of *lading;*" and so he would have found it if the London wag had coquetted with each dish. The English abroad are much quizzed about their dinners; but facts establish that they can get up a dinner equal, if not superior, to any to be seen on the table of the most celebrated Parisian epicure. A dinner of this description was given six years back at the Clarendon hotel to Lord Chesterfield, on his quitting the office of Master of the Buckhounds. It was prepared from the order of Count d'Orsay, and cost six guineas a-head. The dinner was of a first-rate description, and consisted of a number of English dishes, such as turtle, whitebait, venison, green goose, intermingled with the most *recherché* of the French delicacies. We must not too hastily undervalue the gastronomic abilities of the English, for I have the authority of Ude for stating, "that cookery in England, when well done, is superior to that of any other country in the world." The late Earl of Dudley, who was highly accomplished in these as in all other matters, has laid down the following axiom on the subject of dinner: "A good soup, a small turbot, a neck of venison, ducklings with green peas, or chicken with asparagus, and an apricot tart, is a dinner fit for an emperor." To this doctrine I willingly assent.

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* A wag, on being told it was the fashion to dine later and later, said, "I suppose it will end in not dining *until to-morrow!*"

First and foremost, as to the economy of the table. A dinner party should never be too large. It should consist of persons of some pretensions to conversational ability. A dinner without a sprinkling of what Milton impudently termed the "fair defects of nature," is quite intolerable. They form the sun of the table; deprived of them, how dull and insipid would be the best repast. Good waiting is as essential as good cooking. Mr Walker describes, with considerable eloquence and feeling, a dinner which he very much enjoyed, where a waiter was stationed behind each chair. It is necessary that previous to sitting down to dinner, all disagreeable ideas should be banished from the mind. Good digestion is incompatible with mental perturbation. Cheerfulness at meals should be always encouraged, and therefore music, singing, and enlivening conversation invariably act beneficially on the digestive organs, and increase their efficiency. Having considered the preliminaries, let me say a few words with reference to the first course generally brought to the table; I mean the soups. Most epicures fight shy of the substantial and nourishing soups. They destroy the keenness of the appetite. In the celebrated song of 'Wednesbury locking,' the guests are to dine for a groat; but on condition that, before they begin the beef, they are to swallow a gallon of broth. Two gentlemen, afterwards eminent in their profession—one of them indeed became chief justice of England—served their clerkship with a very rich, but excessively miserly, attorney, in the county of Cheshire, whose larder was generally very ill supplied. "I know not what I shall do, sir" (he resided in the country), said his housekeeper to him one day, on finding that two of his clients intended to stop to dinner, "there will not be dinner enough I fear."—"Have you *brothed* the clerks?" inquired the lawyer. "I have, sir," said the housekeeper. "*Then broth them again*," resumed the miser.* I have often been astonished at the quantity of substantial soup which I have seen persons swallow, quite regardless of the dishes that are to follow. Light gravy, or spring soups, are better than the majority of soups generally seen at table; but even they should be taken in moderation. Too large a quantity of liquid taken at dinner impairs the functions of digestion, by diluting the gastric juice. If turtle soup must be eaten, the adjunct punch ought not to be forgotten. The strong nourishing soups are not good for persons of weak digestion, for them mutton broth and weak beef-tea are better.

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* This story is related on the authority of the author of the 'Cibara Memorabilia,' in 'Fraser.'

The pet *potage* of George III was a rich vermicelli soup, with a few very green chervil leaves in it; and with his more epicurean successor, it was equally a favourite. It was first served from the kitchen at Windsor.* Now as to fish. The Romans were excessively fond of fish. Hortensius is said to have wept when one died. The Licinii family assumed the cognomen, Muræna, because the head of the family delighted in that fish. At the banquet of Nasidienus, the muræna was served up in a gravid state, and swimming in shrimp sauce.

"In a large dish an outstretch'd lamprey lies,
With shrimps all floating round: the master cries,
'This fish, Mæcenas, big with spawn was caught,
For after spawning time its flesh is naught.'"

Fish is easy of digestion, but not so nutritious as the flesh of warm-blooded animals. Its nutritive property and digestibility are in proportion to the oleaginous matter it contains. Owing to the absence of all stimulating properties in fish it forms a good repast for invalids and persons of weak stomach. Many tribes of antiquity lived solely on fish diet, and they were generally in a state of great moral and physical abjection. Those who live much upon fish are said to have large families. Tourtelle observes, that more children are seen in seaport towns than elsewhere. In Japan and China, where scarcely any other kind of food is met with, the population is immensely great.

I question, however, whether fish diet increases the productive functions. Fishermen do not live exclusively on fish. It is true they generally enjoy good health, and this may be attributed to the pure air they inhale, and the constant exercise in which their avocations compel them to indulge. Jockeys are generally fed upon fish when it is found necessary to reduce their weight. The least heating and more nutritive of the fish species are turbot, cod, whiting, haddock, and sole. If, after being cooked, the fish have an opaque and flaky appearance, it may be pronounced to be good.

Whiting and haddock are more easy of digestion than cod, owing to the latter containing more glutinous matter than the former. Fish is much improved by a process termed crimping. Turbot is rendered indigestible by the lobster sauce which is taken with it. Sole is a good fish for delicate stomachs. Salmon is the most nutritive of our fish, but it does not agree with persons of weak digestion. It is heating and oily, and the sauce usually eaten with it renders it unwholesome. The sooner a fish is dressed after death the better. Pliny says, that the Roman epicures were so fastidious as not to tolerate the mullet, unless it died whilst on the table. This spectacle, during which the fish changed its colour in a singular manner until entirely lifeless, was so pleasing that the dying fish was exhibited in a glass vessel to the guests before dinner; 'Oculos ante quam 'qulum pavit.' Salmon trout is more digestible than salmon, although not so nutritive. Eels are very objectionable. With reference to shell fish I would make a few observations. It is a fallacy to suppose that oysters are good for weak stomachs. When taken they are better raw than when cooked. They are, however, nutritive. Lobsters, like oysters, are nutritive, but not easy of digestion.

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* The French complain of the English mode of eating soup. It is said that a Frenchman sips his soup, whilst an Englishman drinks it.

The cupidity of fishermen, the rivalry of epicures, and the fastidiousness of the palate of salmon eaters, have fancifully multiplied the species of salmon. One of the most celebrated varieties in the annals of epicurism is *l'ombre chevalier*, of the lake of Geneva, identical with the char of England, the Alpine trout, the *rötheli* of Germany, and the *schwarz renta* of Saltzburgh. In Austria the trout is most delicious. They are the fish bred in the snow-fed rivulets of the Alps, brought from thence and prepared for the tables in stews, perforated with holes, sunk in some running stream. They are carefully fed; and when required for the table, make one leap from the cold water into the saucepan. They are served either fried or simply boiled in their own dark blue coats, beautifully spotted with red; and when in good condition, have all the firmness of the white of an egg.

With reference to poultry, it should be borne in mind, that the flesh of chickens or young fowls is more easy of digestion, but not so nutritious as that of old. The same may be said with regard to the flesh of all animals.

Most men are practically acquainted with the influence of the mind upon the organs of digestion. There is a direct nervous communication between the stomach and the brain, and if the former be affected by any mental excitement, the latter is sure to suffer. How much the appetite depends upon the absence of all uneasiness of mind! Digestion cannot proceed healthily as long as the mind is troubled. A person may eat, and that, too, heartily, but his food does not form healthy nutriment. It is, therefore, a matter of essential importance, in order to properly digest the food, that the mind should be preserved in a state of tranquillity.

To show how dependent the stomach is upon the supply of nervous influence from the brain I have only to refer the reader to the two following facts, mentioned by Dr Combe in his 'Physiology of Digestion.' Brachet starved a dog for twenty-four hours, till it became ravenously hungry, after which he divided the nerves which convey to the brain a sense of the condition of the stomach. He then placed food within the dog's reach, but the animal, which was a moment before impatient to be fed, went and laid quietly down, as if hunger had never been experienced. When meat was brought close to it, it began to eat; and apparently, for having no longer any consciousness of the state of its stomach, whether full or empty,—it continued to eat till the throat and the gullet were inordinately distended. In this, however, the dog was evidently impelled solely by the gratification of the sense of taste; for, on removing the food to a distance of even a few inches, it looked on with indifference, and made no attempt either to follow the dish, or to prevent its removal. Precisely similar results ensued when the nervous communications between the stomach and the brain were arrested by the administration of narcotics.

The great art of digesting food is, first, to well masticate it. On this subject the French proverb is literally true—"*Viande bien machée est a demi digerée.*" When any derangement in the teeth of horses prevents them from chewing their food, the hide becomes hard and dry, more like the covering of a hair trunk than of a living animal. Mr Walker relates the case in his 'Original,' of a young lady who was subject to dreadful fits, for which no remedy could be discovered, till a physician found out her teeth were in such a state as effectually to prevent mastication. He adopted the strong measure of causing all her teeth to be drawn, and a fresh set put in, from which time she completely recovered.

It is still a *vexata questio* with medical men, whether a nap after dinner is injurious to the health. The habit of sleeping after eating, if once acquired, is not easily broken through. Under certain circumstances the practice may be recommended. In southern climates, where they dine at an early hour, a nap is generally taken immediately after dinner. Homer says, that Nestor always slept after his meals. Galen advises persons advanced in life to do the same. On this subject I cannot do better than quote the authority of Dr Paris. He says, "Sleeping after dinner is a practice of very questionable propriety; it does not appear essential in this country, where animal food is used in such considerable quantities. Its effect is to hurry on the latter stages of digestion, and hence the fever and state of excitement in which a person not unfrequently wakes. In states of disease it may occasionally be useful, and the recumbent posture may expedite the passage of the aliment out of the stomach into the intestines; but the person who lies down for the accomplishment of such an object, should be careful to remove all ligatures from his body." Sleeping much after dinner is said to predispose to apoplexy. Should a nap be taken it should be but for a few minutes—ten at the outside. The practice of sleeping for an hour or more after dinner is extremely pernicious. Abernethy recommended a short doze after dinner, but it should not be forgotten that this advice was only given to persons in bad health.

Violent exercise before eating is injurious. A person should never sit down to dinner labouring under physical fatigue. Quietude of mind as well as of body is necessary in order for the digestive organs to act with healthy vigour. Moderate exercise in the open air very much facilitates the digestion of food. After loading the stomach, much exertion of mind or body impairs the energy of the functions of digestion. This has been well established.

Having said so much upon the choice of food, I must not neglect the consideration of the important subject of cookery. It is too much the habit to think and talk lightly of this science. No man of sense will despise the art. The most scientific men on the continent have turned their attention to the subject, and many have written elaborate and learned treatises on the science of cookery. Food, well and properly cooked, is half digested. Many cases of severe and incurable attacks of dyspepsia have ensued from eating meat improperly prepared for the table. How much our domestic comforts are at the mercy of those who preside over the kitchen!

It has been facetiously observed by those who were desirous of being witty at the expense of the faculty, that there exists an alliance between cooks and physicians. Seneca observes, that in proportion to the number of cooks so have diseases multiplied. A celebrated physician, when visiting his patients, never failed to pay his respects to the cooks. "My friends," he would say, addressing himself to them, "accept my best thanks for all the kind services you render to us physicians: were it not for you and your pleasing poisons, the faculty would soon find themselves inhabitants of the workhouse." The French system of cookery has been much railed at, but it is pretty generally believed that many of the French dishes are more easy of digestion than those too often seen on an Englishman's table. The fact is, that many of our best dishes are overcooked, which cannot be said of the French. Boiled meats are easy of digestion, but not so nutritive as others. If the meat is boiled too long it becomes very indigestible. Veal and chicken are more wholesome and nutritive when roasted; this may be said of all meats. The art of cookery has been a subject of importance in all ages. The following facts connected with it may prove interesting.

It is said that Domitian called a meeting of his senate for the purpose of considering the best mode of dressing turbot. Tomocreon, another glutton of ancient times, had the following epitaph written for his tombstone :—

"Much drinking, much devouring,
Saying things most gross and odious ;
Here I lie in my urn—
Tomocreon, the Rhodius."

Cooks have, during all ages, held a high position in the estimation of mankind. In the time of the first Roman emperors enormous salaries were given to the cooks. Mark Anthony once presented his cook with a whole corporate town, or *municipium*, solely because he succeeded in dressing a pudding to the satisfaction of Cleopatra—an example which Henry the Eighth of England was not ashamed to imitate, by parcelling out one of the crown manors as a reward to a lady who had compounded a pudding to his taste.

Amongst the moderns, Louis the Fourteenth deserves notice for the attention he paid to the science of eating. His celebrated *mâitre d'hotel*, Bechamel, was considered the prince of cooks. No less distinguished was poor Vatel, cook to Prince de Condé, who committed suicide because he was disappointed in not having sufficient fish for a grand entertainment which his master had given to the *élite* of the Parisian nobility.* M. Carème was also a celebrated Parisian cook, for whose services half the sovereigns of Europe entered into competition. At last he offered himself to George the Fourth, when Regent, and received a salary of 1,000*l.* per annum. He, however, only lived with the Regent a few months—he complained that it was a *ménage bourgeois.* During the time he officiated at Carlton House, it is said very large sums of money were given for his second-hand *pâtes*, after they had made their appearance at the Regent's table. The emperors of Russia and Austria made the most liberal offers to Carème, but he replied, "*Mon ame, toute Francaise, ne peut vivre, qu'en France.*" He subsequently became cook to Baron Rothschild, who was celebrated all over Europe for the magnificence of his dinners. Lady Morgan, who was personally acquainted with Carème, and who has given to the world the leading particulars of his life, has published a graphic sketch of a dinner prepared by him at the Baron Rothschild's villa, to which we direct the attention of those curious in these matters.†

In connexion with the subject of Diet and Dietetics, I may briefly allude to the history of several well authenticated cases of persons who have been capable of eating enormous quantities of food without any sensibly injurious effect. In the instances about to be cited the appetite was evidently of a morbid character.

King James the First was once presented to a man who could devour a whole sheep at a meal. His majesty asked the glutton whether he could do more work than other men, and having replied that he could not, the king exclaimed, "Hang him then ; for it is unfit that such a man should live that eats as much as twenty men, and cannot do as much as one." Hardicanute, the last of the Danish kings of England, was a great eater. Historians have termed him "Bocca di Porco," swine's mouth. His tables were covered three times a day with the most costly viands. He died, suddenly, after a debauch of a wedding banquet. His death was so welcome to his subjects, that they celebrated the day with sports and pastimes, calling it *hoc-tide*, which signifies scorn and contempt.

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* Madame de Sevigné says, Vatal perished "á force d'avoir de l'honneur â sa manière ; on loua fort et l'on blama son courage."

† 'France in 1829-30,' vol. ii, p. 414.

Charles Domery, aged 21, six feet three inches in height, when a prisoner of war at Liverpool, consumed in one day four pounds of cow's udder, and ten pounds of beef, both raw, together with two pounds of tallow candles, and five bottles of porter, and although allowed the daily rations of ten men, he was not satisfied. Baron Percy has recorded a still more extraordinary instance in a soldier of the name of Farare, who, at the age of 17, could devour, in the course of 24 hours, a leg of beef, 24 pounds in weight, and thought nothing of swallowing the dinner prepared for fifteen German boors.

On the authority of a writer in the 'Quarterly Review,' there is a lord-lieutenant of one of the western counties who eats a covey of partridges for breakfast every day during the season. Most people must have seen or heard of a caricature representing a gentleman at dinner upon a round of beef, with the landlord looking on.—"Capital beef, landlord," says the gentleman, "a man may cut and come again."—"You may cut, sir," responds Boniface, "but I'll be hanged, sir, if ever you come again!" It is said that the sketch is founded on fact, and alludes to a celebrated M.P. The same *bon-vivant* on one occasion, being detained late in the city, turned into the celebrated Old Bailey beef-shop, where, according to the landlord's computation, he demolished about seven pounds and a half of solid meat, with a proportionate allowance of greens. His exploits at Crockford's have been such that the founder of that singular institution had more than once serious thoughts of offering him a guinea to sup elsewhere, and has only been prevented by the fear of meeting with a rebuff similar to that mentioned in 'Roderick Random' as received by the master of an ordinary, who, on proposing to buy off an ugly customer, was informed by him that he had been already bought off by all the ordinaries in town, and was consequently under the absolute necessity of continuing to patronise the establishment.

The once celebrated Duke of Queensbury, of sporting notoriety, was in the habit of making the most extraordinary bets. On one occasion he heard that there was a man resident in Norfolk who could eat, at one sitting, a most enormous meal, sufficient to satisfy the appetites of forty ordinary men. The duke had this man up to town, and betted a large sum of money that he would find a person who would be able to eat more than the Norfolk glutton. In a short time he found his man. The belligerent parties, with their respective friends, met at an hotel, where a superfluity of dishes was provided. The table groaned beneath the weight of roast and boiled turkeys, geese, legs of mutton, and rounds of beef. At a given signal the two men commenced eating; the duke was present at the commencement of the engagement, and dire was the slaughter—shoulders of mutton, roast ducks, and boiled fowls disappeared as if by magic. The duke at last declared that the sight was too disgusting for him to witness, and he therefore proposed to retire to an adjoining room, giving instructions that a person should occasionally come to him and report progress. After the lapse of some time a friend of the duke rushed into the room where he was waiting the issue of the conflict, and exclaimed, with a loud voice, "My lord duke, my lord duke, I congratulate you; it is all right; your man is winning."—"What do you mean?" asked the duke.—"Why, my lord, your man is three roast geese, and four boiled legs of mutton, a-head of t'other chap."

The prince of epicures* was the Emperor Vitellius. All the woods in

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* The Greek philosopher Epicurus has been sadly maligned. We would infer that he was a man whose whole soul was devoted to the enjoyments of the table—

Italy and the two seas were covered with people to procure for him the most exquisite meats and the scarcest fish for his table. He made four principal meals a day, and sometimes five. He had so little control over his sensations of hunger, that often during the sacrifices he would snatch portions of the animals half baked from the fire, and devour them in the presence of the assembly. He invited himself to the houses of his friends, and eat so enormously that he nearly ruined them. It is said that his brother, Lucius Vitellius, once treated him to a dinner consisting of two thousand dishes, and seven thousand birds of great value and scarcity. He had always in his house a quantity of pheasants' livers, tongues of fishes, peacocks' brains, the entrails of lampreys. Josephus says that, had this prince lived to an advanced age, all the revenues of his empire would not have been sufficient to have provided him with the luxuries of life.

Julius Cæsar sometimes ate at a meal the revenues of several provinces. Nero often sat at table from midday till midnight, amidst the most monstrous profusion of eatables.

Louis, who was a great epicure, invented a dish called "*Truffes a la purée d'ortolans.*" The happy few who tasted of this dish, as concocted by the royal hand of the king himself, described it as the very perfection of the culinary art. The Duc d'Escars was sent for one day by his royal master for the purpose of assisting in the preparation of a glorious dish of "truffes a la purée d'ortolans;" and their joint efforts being more than usually successful, the happy friends sat down to the repast, the whole of which they devoured between them, and, after triumphing in the success of their happy toils, they each retired to rest. In the middle of the night the Duc d'Escars suddenly awoke, and found himself alarmingly indisposed; he rang the bell of his apartment, and when the servant came in the physician was sent for. The duc, however, died of a surfeit. In his last moments he caused his attendant to go to the king to inquire whether his majesty was similarly affected. Louis was found sleeping soundly, and in the enjoyment of the best of health. In the morning, when the king was informed of the sad catastrophe of the companion of his previous day's debauch, he exclaimed, with perfect *nonchalance*, "Oh, I told him I had a better digestion of the two."

But still more curious than the preceding cases are those instances of persons who have swallowed, and apparently digested, stones, pieces of iron, steel, mortar, and even live animals. Men have been known to swallow iron nails, marbles, live fish, and snakes, with impunity.

The late Dr Marcet relates, in the 'Medico-Chirurgical Trans.,' vol. xii, the history of an English sailor, who, in imitation of a conjuror, whose tricks he had just witnessed, and in a drunken frolic, swallowed several clasp knives. Ten years afterwards this man died in Guy's hospital.

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that he was the *beau-ideal* of a *bon-vivant*. Epicurus was a model of self-denial; over the door of his house at Athens he had inscribed the following words:—

> "A great house, but no cheer,
> Bread and cheese, small beer;
> Epicurus lives here."

He was not, as represented by some, the great Epicure of antiquity, or the patron of voluptuousness. His philosophy was a self-denying philosophy—his doctrines were directly opposed to all excesses. He was, truly, the advocate of pleasure, and he recommended temperance in everything, under the belief that without that neither the body nor the mind could be kept in a sound state of health.

Several most skilful surgeons examined his body with great attention and interest; to the astonishment of all, the blades of many knives were found in his interior, some of them remarkably corroded and prodigiously reduced in size, whilst others were comparatively in a state of tolerable preservation. The knives are still to be seen in the museum attached to the hospital.

The appetite sometimes becomes depraved, and then all kinds of disgusting things are eaten with an apparent relish. Delicate young ladies have been known to swallow chalk, cinders, sealing wax, sand, and even bits of glass. Dr Elliotson has heard of cases where the patient has longed for raw flesh, live fish, and some have actually eaten live kittens and rats! At Leyden there were two persons who had a strong *penchant* for spiders, and absolutely eat them whenever they had an opportunity.

Tacitus says, that there was a man at Colonia Agrippina whose favourite dish was spiders. Various ancient tribes lived on soups made of snakes and scorpions. The Chinese are said to esteem rotten eggs as one of the greatest delicacies, and so far do they carry this desire, that putrid eggs are rated thirty per cent. higher than fresh ones. The Chinese gentry consider the birds' nests of the swallow species as a particular delicacy. None but persons of great opulence can indulge in this luxury. The nests are not made of clay, but of a substance resembling isinglass in appearance. At Canton the nests of the best quality sell for 5*l*. 18s. per pound. The Chinese eat them under the impression that they are stimulating and tonic. The whole quantity of birds' nests exported from the Indian Archipelago is estimated at 242,400 pounds, worth 234,290*l*. sterling.

Medical men are often asked whether certain articles of food are wholesome or unwholesome. Perhaps the most pertinent answer to such interrogatories was that given by the late Dr Manderville. He happened on one occasion to be the convivial guest of one of the first Earls of Macclesfield, who closely examined the doctor as to the wholesome qualities of certain species of food in which his lordship was in the habit of indulging. To these queries Dr Manderville observed—"Does your lordship like it?"—"Yes."—"Does it agree with your lordship?"—"Yes."—"Why then it is wholesome." To ask a person whether any particular description of food be good or bad, without any reference to the constitutional peculiarities of the individual, is as absurd as asking whether the wind be fair without specifying to which quarter of the globe the vessel is bound. It would be ridiculous to expect the stomach of a delicate lady to digest what a ploughman in robust health is capable of turning with facility into nutriment.

It is injurious to drink much at meals. Those who take a large quantity of liquids during dinner generally eat more than those who take less. The sensation of thirst depends upon the quantity of aqueous fluid circulating in the blood. It has been found by physiologists that the most severe thirst of animals is appeased by injecting watery fluids into the blood. A moderate quantity of liquid should be taken at dinner; too large a portion acts injuriously by diluting the gastric fluid. Persons whose diet is more animal than vegetable require more liquid during their meals. Drinking before a meal is pernicious, whilst drinking during a meal the digestive process is promoted. Those who eat fast require more drink than do others, for, as Dr Phillip says, "the food is swallowed without a due admixture of saliva, and forms a dry mass in the stomach."

It is not my purpose to enumerate the many diseases which may clearly be traced to habits of intemperate eating; I shall merely specify one or two affections that clearly originate from this cause. Persons who eat to excess generally labour under a plethoric condition of the system, and are therefore liable to inflammatory diseases. This is remarkably the case with those who swallow enormous quantities of animal food, and who are sedentary in their habits.

Gouty affections are as much caused by excess in eating, as by intemperance in drinking; the quality as well as the quantity of the food should be attended to. Persons who are in the habit frequently of dining out never can be effectually cured of this disease. I may be asked why a mutton chop and wing of a chicken may not be eaten in company as well as alone, but, as Dr Armstrong says, an epicure who thus reasons is not satisfied unless he eats of three or four different kind of dishes, and drinks of three or four descriptions of wine. The system of treatment pursued by a well-known dog-doctor at Paris is the best that can be adopted for the prevention of gouty affection. Ladies bring their lap-dogs to this Parisian doctor in their carriages, and say their pets are very unwell, and they know not what is the matter with them. The man takes the dogs home, locks them up in an airy room, gives them some water, a little bread, and a dry bone to pick. By way of exercise he makes them skip about two or three times a day by means of a little horsewhip dexterously applied. At the expiration of a fortnight he takes them to their mistresses, quite well, active, and hungry.

Among other evil consequences of good living I must not forget to mention that of corpulency. Mr Wadd, in his amusing monograph on this subject, has cited many interesting cases of obesity. The celebrated Mr Lambert weighed 52 stone 11lbs. A German girl was exhibited at Paris some years ago, who at her birth weighed 13 lbs., at six months 48 lbs., and 150 lbs. at four years; and at twenty she weighed 450 lbs. Dr Beddoes was excessively corpulent; he was nick-named "the walking featherbed." At the court of Louis XV there were two fat noblemen, related to each other; the king having rallied one of them on his corpulency, added, "I suppose you take little or no exercise."—"Your majesty will pardon me," replied the bulky duke, "for I generally walk twice or thrice round my cousin every morning."

Among the causes of obesity I must first notice its hereditary character. Corpulent parents frequently have corpulent children. Next to this may be placed good, generous living, accompanied with little exercise. It is said that a full diet, abounding in oils, carneous, and saccharine matter, seldom fails to fatten, should a person be naturally disposed to corpulency. Corpulency is often but a symptom of vigorous health. Nature, to relieve the system of its redundancy of blood, causes an increased deposition of fat. Good humour and good living are the most common causes of this affection. Solomon remarks, that "A merry heart doeth good like a medicine, but a broken spirit drieth the bones." "Laugh and grow fat," says the old proverb. Sterne observes, "Every time a man laughs he adds to the duration of his life." In alluding to the influence of a life of ease in causing corpulency, Dr Arbuthnot states, that "You may see an army of 40,000 soldiers without a fat man among them, and I dare affirm that, by plenty of rest, twenty out of forty shall grow fat." Who ever saw a fat post-boy? A drink, composed principally of the cane juice, is very fattening. The negroes of the West Indies and the Chinese slaves grew enormously stout during the sugar season. Persons living upon figs and grapes become fat.

CHAPTER IX.

ASPHYXIA; OR, APPARENT DEATH FROM SUFFOCATION, DROWNING, AND HANGING.

In a previous chapter I have considered at some length the phenomena of actual death; it is now my purpose to investigate the subject of apparent death, more especially that which is the result of an obstruction to the passage of air into the lungs. Much benefit will accrue from a general diffusion of the most important facts connected with this branch of inquiry. It is this description of knowledge which may be pronounced to be power. All are interested in the preservation of life, and therefore the minutest degree of information connected with the art cannot but prove valuable to those whose attention has not been particularly directed to the study of medicine.

Few are entirely ignorant of the baneful influence of vitiated air, although they may have little or no knowledge of its physiological action upon the system; and, notwithstanding all must more or less have witnessed the most painful consequences which so often result from breathing an impure atmosphere, how large an amount of popular ignorance prevails on the subject. The lives of hundreds and thousands are yearly sacrificed by inhaling air surcharged with impurities, or deprived of its vital properties. Persons intelligent on all other branches of science, are grossly ignorant of the elements of physiology, and know little or nothing of the influence of external physical agents on the animal economy. In the chapter on Malaria I have given an account of the chemical constitution of the atmosphere. I have there stated that the atmospherical air is composed of two gases, oxygen and azote, in the proportion of twenty-one of the former to seventy-nine of the latter. According to the experiments of Dr Thomson, air, whencesoever taken, consists of twenty parts of oxygen to eighty of azote, or nitrogen. There is also a small portion of carbonic acid in the air, but this does not exceed the one thousandth or one thousand four-hundredth of its bulk. A supply of air is not only essential to animal, but to vegetable life. All organized beings cease to exist if placed *in vacuo.* Should the air become deteriorated by being deprived of its proper proportion of oxygen, the health immediately suffers. Before, however, considering the effects of vitiated air, I would briefly describe the respiratory apparatus. In animals respiration is performed by means of two light, spongy bodies, situated in the cavity of the chest, termed *lungs.*

The lungs are composed of the ramifications of the trachea, or windpipe, of the pulmonary artery and veins, lymphatics, nerves, cellular tissue, &c. The trachea, which is a continuation of the larynx, before it enters the lungs divides into two tubes, termed bronchi ; these subdivide into a number of smaller air tubes, and ultimately expand into clusters of air cells, resembling in appearance little bunches of buds or berries. These cells are for the purpose of containing air. Along with these minute air tubes travel the capillary extremities of the pulmonary artery and veins, the latter to convey venous blood to the minute parts of the lungs from the heart, and the former to bring it back, changed in properties, to that organ, to be circulated through the body. The pulmonary arteries and veins communicate with each other by small capillaries. The air enters the trachea, and is then conveyed along the ramification of the bronchial tubes to the lungs, where it undergoes an important chemical change. The blood formed from the food is black or venous blood, which circulates in the veins, and is devoid of nourishing properties. Before this fluid is circulated through the body it must pass through the lungs, to which organ it is sent from the right side of the heart by the pulmonary artery ; when it arrives at the lungs it is brought in contact with the air contained in that organ, and, after undergoing arterialization, it is returned to the left side of the heart by the pulmonary veins. The oxygen of the air enters into combination with the carbon contained in the venous blood, and arterial blood is immediately formed. Carbonic acid is also given off upon this change, arterialization, taking place. This process is necessary to the existence of life. Should anything prevent the air gaining access to the lungs, the blood undergoes no change ; circulation for a short period is still carried on, and black venous blood is sent to the brain, where it acts like a poison ; and if the healthy action of the lungs be not restored, the person dies—*poisoned by his own blood.*

Respiration is not exclusively confined to the lungs, even when this organ is in a most perfect state of development. The blood, circulating through the minute vessels on the surface of the skin, becomes aërated, provided the integuments are not too dense in structure. In frogs the cutaneous respiration is carried on to so great an extent, that if impeded by covering the skin with oil or other unctuous substance, death will take place almost as soon as if the lungs were removed, and the animal may be supported by it alone, if not exposed to a very elevated temperature. In birds, enclosed in vessels out of which their heads protrude, carbonic acid will be found to replace a portion of their oxygen ; and the same result has been obtained by the similar enclosure of the limb of a human body. Aquatic animals do not decompose the water they breathe, but merely abstract the oxygen from the air contained in it ; for if one of this class be placed in a limited quantity of water, from which it soon exhausts the air, or in water from which the air has been expelled by boiling, it dies almost as soon as an animal whose respiration is aërial, when placed in a vacuum.

What is the nature of the change which the air undergoes in the lungs? Numerous experiments have been made by Lavoisier, Seguin, Menzies, Sir H. Davy, Messrs Allen and Pepys, to ascertain the quantity of carbonic acid generated, and the quantity of oxygen and nitrogen consumed in the lungs. The result is, that air, after being once respired, contains 8 or 8½ per cent. of carbonic acid. One hundred parts of air, once respired, contain 5·82 parts of carbonic acid. In 24 hours the quantity of this acid formed is found to be 14,930 cubic inches, or 17,811 grains. Less carbonic acid is formed during respiration than will replace the oxygen consumed. According to Bostock, as quoted by Dr Combe, an average sized man consumes about 45,000 cubic inches of oxygen, and gives out about 40,000 of carbonic acid in 24 hours; or 18,750 of oxygen, and 16,666 of carbonic acid, in 10 hours.

What is the number of respirations in a minute?—This must vary according to circumstances. In a healthy adult male it ranges about twenty in a minute; it exceeds this in females and children. When the lungs, and their investing membrane, the pleura, are diseased, the respirations become much hurried. The quantity of air inhaled in a single inspiration must, of course, depend upon the size of the chest; it varies from 15 to 40 cubic inches. Sir H. Davy makes the average as low as from 13 to 17 inches; but Dr Menzies, who investigated this point with great attention, estimates the quantity at 40 cubic inches. It is said that the lungs are capable of holding, by a strong inspiration, about 120 cubic inches of air.

It is found that the time in which life can be supported without air is shorter in warm-blooded than in any other animals. If any of the former species be placed in the vacuum of an air pump, death takes place in less than a minute. Under these circumstances birds die in 30 or 40 seconds. Reptiles will live for a considerable time in a vacuum, and in irrespirable gases. Carradori found that a tortoise placed under oil lived from 24 to 36 hours. Frogs die in less than an hour when placed under oil. In water impregnated with air they live a long time, as respiration is carried on by the skin. Edwards confined toads in baskets and placed them in water; they lived several days. They have lived a few hours in water totally deprived of air. Muller has removed the lungs of frogs, after tying them at the root, and the animals still lived about thirty hours, respiration being performed by the skin. New-born animals will often live a long time without air, after having respired. This period lessens as the temperature rises with age. Amphibious animals live long without air.

Animal life cannot be sustained without a constant supply of pure air. In order to understand the physiological action of deteriorated air on the vital organs, it will be necessary to point out the relationship between the brain, the heart, and the lungs. It has been established by experiments performed upon animals, that the heart and lungs will continue to act after the brain is removed, provided artificial respiration be performed; that the action of the heart is not entirely dependent on the state of the cerebral organ. Should the brain, however, become injured, the heart will be more or less implicated in the affection, in consequence of the action of the muscles of respiration being suspended. Excitement of mind will often occasion fainting; the heart acting very feebly, little or no blood is sent to the brain. The arterial blood formed in the lungs acts as a stimulus to the brain, enabling that organ to perform its necessary functions; without a healthy supply of arterialized blood the brain would cease to generate the nervous fluid, which acts so important a part in the animal economy.

Deprive the centre of the nervous system of arterial blood, and death would immediately ensue. If we can suppose a number of animals confined within a limited space, containing a certain amount of atmospheric air, each animal would consume a certain portion of the oxygen of the air ; this would enter into chemical combination with the carbon of the venous blood in the lungs, and carbonic acid gas would be thrown off or exhaled. As long as there existed any oxygen in the air, so long life would be sustained. In proportion as the vital properties of the air were absorbed into the system, so would the atmosphere become loaded with carbonic acid, until the animals confined within the space would be compelled to inhale carbonic acid, and thus become poisoned. This may be illustrated by a variety of experiments.

Let a mouse be confined in a large and tight glass full of air. At first the animal suffers no apparent inconvenience ; but in proportion as the consumption of oxygen and the exhalation of carbonic acid gas proceed, it manifests symptoms of uneasiness. At last it is seen to pant for breath, it then struggles for air, and in a few hours it dies convulsed, exactly as if drowned or strangulated. A short period after young Crabbe, the poet, was sent to school at Bungay, he had a narrow escape. He and several of his school-fellows were playing at soldiers, and, by way of punishment, they were put into a large dog kennel, known by the terrible name of the "black hole." George was the first that entered, and the place being crammed full with offenders, the atmosphere soon became pestilentially close. The poor boy in vain shrieked that he was about to be suffocated. At last, in despair, he bit the lad next to him violently in the hand—"Crabbe is dying, Crabbe is dying!" roared the sufferer. The door was immediately opened by the sentinel placed to guard the culprits. Crabbe's father states, that if his son had been confined a minute more he would have died. The horrible fate of the 146 Englishmen who were shut up in the black hole of Calcutta in 1756, is strikingly illustrative of the destructive consequences of an inadequate supply of air. The whole of them were confined in a place only 18 feet square. There were only two very small windows by which air could be admitted, and as both of them were on the same side, ventilation was utterly impossible. Scarcely was the door closed upon the unfortunate prisoners, when their sufferings commenced, and in a short time a delirious and mortal struggle ensued to get near the window. Within four hours those who survived lay in the silence of apoplectic stupor ; and at the end of six hours, ninety-six were relieved by death ! In the morning, when the door was opened, twenty-three only were found alive, many of whom subsequently died of putrid fever, caused by the vitiated air which they had been compelled for so many hours to breathe.

Having spoken of the effect of vitiated air on the health and life, I will now consider the subject of apparent death from asphyxia, or stoppage of respiration.

The etymology of asphyxia implies, as Dr Williams correctly remarks, the converse of the pathological condition to which the name is applied. The term literally signifies absence of pulse. In the most complete forms of syncope, or fainting, the action of the heart never altogether ceases, it is only unusually weakened. In asphyxia the pulsation continues after the breathing has stopped. The characteristic of asphyxia is no breath, instead of no pulse. Having dwelt on the importance of a supply of arterialized blood to the brain and other organs, the next question for consideration is, what are causes of asphyxia ? Everything which has a tendency to interfere with the functions of respiration will cause asphyxia. The causes may be mechanical or chemical. Pressure on the parities of the chest preventing the due expansion of the lungs will give rise to asphyxia. Weights placed on the chest will prevent a proper supply of air from entering the lungs, and cause death; collections of fluid in the thorax will interfere with the due elevation of the ribs, and give rise to the same unhappy result. The most common cause of asphyxia is the absence of oxygen in the air inspired. There are also certain irrespirable gases which produce the same effect. There are many gases which, if not positively, are negatively injurious. Among the latter are hydrogen, azote, and carbonic acid. The two former gases are capable of sustaining life for a short period, but the latter, if respired in a concentrated form, produces an instant spasmodic closure of the glottis. The irrespirable gases are, carbonic acid, ammoniacal gas, muriatic acid gas, deutoxide of azote, nitrous acid gas, chlorine, &c. Asphyxia is also caused by external pressure on the neck, as in hanging, strangulation, by the obstruction of air into the trachea, caused by extraneous bodies having entered the air passages. Anacreon, the poet, perished from a grape seed having entered the trachea. Gilbert also, a poet, died in a similar manner. He was a man of great appetite, and in the midst of a festival went into a neighbouring room, but did not return, to the great surprise of his convivial guests. He was found quite dead, stretched on a couch. Upon examination a small piece of mutton was found closing the entrance to the larynx, completely preventing the ingress of air to the lungs. Paralysis of the pneumogastric nerves will paralyze the respiratory muscles, and cause asphyxia and death.

Phenomena of Asphyxia.—Should a person be exposed to the influence of air deprived of its vital elements, the first sensation which he would experience would be referred to the region of the thorax. The feeling of want of air would give rise to an involuntary attempt to expand the chest. After a short time the sensation would be extremely agonizing; consciousness would be suspended; the individual would, notwithstanding, make almost instinctive efforts to breathe. The face becomes livid, the veins of the head swell, the eyes, suffused, appear to start from their sockets. Blood will sometimes gush from the ears. The sphincter muscles become relaxed. The fingers are bent, the nails blue, and the hands closed. These symptoms are generally present in asphyxia from hanging. The appearance of the countenance is highly characteristic. Shakspeare's description of the frightful physiognomy of Duke Humphery after death, from suffocation, is considered physiologically correct.

> "But see! his face is black, and full of blood;
> His eye-balls farther out than when he lived,
> Staring full ghastly like a strangled man:
> His hair upreared; his nostrils stretched with struggling;
> His hands abroad displayed, as one that grasped
> And tugged for life, and was by strength subdued."
> HEN. VI; *Part* 2, *Act* 3, *Sc*. 2.

Dr Dunglison, the American physiologist, has observed with reference to the appearance of the face after death from hanging, that whatever distortion or mark of suffering may have existed prior to dissolution, there is little or no evidence, after the spirit has departed, when the features usually exhibit a placidity of expression, a "rapture of repose," singularly contrasting with the previously excited condition. This physician had many opportunities of examining the countenances of those who have been hanged, where the rope was removed prior to the total abolition of the vital principle, and in none of these cases were there the evidences of suffering in the features, that have been so often described, especially by poets.*

With regard to the theory of asphyxia, many ingenious speculations have been broached at various times by physiologists. Into the literature of this subject it would be useless for me to enter; no practical advantage would result from it. The theory of one era is overturned by the theory of the succeeding one; the physiological speculations of one great man are superseded by the philosophical conclusions of his successor. Death from asphyxia was commonly supposed to be caused by the circulation of venous instead of arterial blood through the lungs and brain. It is now admitted that the failure of animal life is the result more of a deficient quantity of blood than by its being venous in character. The blood becomes obstructed in the capillaries of the lungs, and the general circulation is arrested. It would seem, from the experiments of Dr Kay, that venous blood has not so poisonous an effect on the brain as previous physiologists and experimentalists imagined.

The irritability of the muscular fibre is retained by the circulation of venous blood, which would not be the case were it so destructive as it is represented to be. Dr Kay has also injected large quantities of venous blood into the carotid arteries of animals without producing loss of sensibility or a suspension of the action of the brain. There is no doubt, however, that venous blood circulating through the brain assists materially in producing the phenomena which accompany asphyxia. Such blood is deficient in oxygen, and abounds with carbonic acid. Nysten injected carbonic acid into the carotid artery, and the consequence was an immediate loss of sensibility and motion, in fact, asphyxia. The following are the stages of death from this affection:—The mechanical or muscular actions of the respiratory apparatus cease; this is followed by a stoppage of the vital or expansive motion of the lungs; the circulation in this organ is then suspended. The brain and nervous system next participate in the disordered action. Upon the suspension of breathing the blood becomes stagnated in the minute capillary vessels of the lungs. The left side of the heart receives an inadequate supply of the vital fluid, the blood being accumulated in the pulmonary arteries and right auricle and ventricle of the heart.

Asphyxia from Hanging.—Death under these circumstances is generally produced with great rapidity. It is supposed that this arises from dislocation of the first cervical vertebræ of the neck, but it is an erroneous notion to suppose that this often takes place. Sometimes the sufferings of the wretched criminal are protracted, in consequence of the rope round the neck being unscientifically adjusted. Should the cord not be sufficiently tight to perfectly close the windpipe, a small portion of air obtains admission to the lungs, and life is prolonged for a longer period than it would be were the passage to the lungs perfectly stopped. A celebrated French executioner, on being asked how he dispatched his victims so rapidly, observed, that he caused a laceration of the trachea, and a luxation of the first cervical vertebræ from the second, by placing the knot of the cord under the neck, and then giving a rotary motion to the body, at the moment when the ladder was removed from its feet.

Is death by hanging attended with much pain? It is generally thought not, provided the trachea be completely closed. The violent struggles which many exhibit at the moment of suspension, convey to the minds of the by-standers the idea that considerable physical pain is inflicted by this mode of death; but we should recollect that in a very short period after a stoppage of respiration, as in drowning, &c., consciousness is entirely suspended, and that whatever may be the amount of suffering, the unhappy criminal is providentially insensible to it.

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* 'Human Physiology.'

Wepper refers to the history of a man and woman who were restored to life after being hanged. They stated that the first sensation which they experienced, when suspended, was that of passing into a profound slumber. Foderé relates the case of a medical student who hanged himself in order to ascertain what feelings were produced in criminals so executed. For this purpose he passed a ligature round his neck, and fastened it to a hook behind the door. When suspended he immediately lost all consciousness. When restored to animation, he said that the first effect experienced was that of a dazzling light before the eyes, accompanied by tingling in the ears. In a case mentioned by Morgagni, flashes of light were seen before the eyes just prior to the suspension of consciousness. It was at one time the generally received opinion that, in hanging, death was the result of apoplexy. The pressure of the rope on the blood-vessels of the neck was supposed to stop the flow of blood to the brain, and thus give rise to the affection mentioned; but the experiments of physiologists have completely established the erroneousness of that opioion. It is now considered that asphyxia is induced, and that this is the real cause of the suspension of vitality. If an opening be made in the windpipe or trachea, and a small silver tube introduced into the aperture, the animal may be hanged, and life will be preserved, provided the rope be applied above the opening. Under these circumstances respiration is not stopped; the circulation goes on, and the blood sent to the lungs is exposed to the influence of oxygen, and thus becomes arterialized. Apply the rope below the aperture in the air tube, breathing will cease, and death follows in a few minutes, as the consequence of the circulation being impeded, and black venous blood surcharged with carbonic acid being sent to the brain. The person becomes narcotized, the poisonous carbonic acid gas acts upon the brain like opium. Many attempts have been made to save the lives of persons sentenced to be executed, by making, previously to the application of the rope, an opening in the trachea. This has in a few instances succeeded.

Dr Mahon relates the particulars of the following interesting case:—A butcher of the name of Gordon was condemned to execution at the Old Bailey, for highway robbery, in the beginning of the last century. Having amassed great riches by his successful career of crime, he persuaded a young surgeon, by the hope of a great reward, to attempt to save his life. The surgeon proposed the plan of an opening low down in the trachea, and introducing through it a small canula. This was secretly accomplished previous to the execution; the blood that was effused in consequence excited some suspicion, but being attributed to a desperate attempt of suicide, the circumstance only occasioned the hastening of the hour of his execution. After the body had hung the usual time, it was taken down, consigned to the relations, and quickly removed to a neighbouring house, where the surgeon was anxiously waiting its arrival. He immediately abstracted some blood from the jugular vein, and had recourse to every means to restore animation. Gordon opened his eyes, heaved a sigh, and died.

A man was executed at Tyburn in April, 1733. Mr Chovet having, by frequent experiments on dogs, discovered that death could be prevented by making an opening in the windpipe, undertook to save this wretched man's life. An incision was accordingly made in the trachea, and when the man stopped his mouth, nostrils, and ears, for some time, air enough came through the opening to sustain vitality. When hanged, this man was observed to be alive after all the rest of the criminals, executed with him, were dead ; and when he had hung for three quarters of an hour he was conveyed by his friends to a house in the Tyburn road ; when there he opened his mouth several times and groaned. He was bled from the arm. The man ultimately died ; and Dr G. Smith, who relates the particulars of the case, attributes the want of success to the great weight of the man, by which the compression of the vessels of the neck must have become more effectual than in ordinary cases, and perhaps at the same time the opening in the trachea was not sufficiently free.

Should there be in the trachea or windpipe depositions of bony matter, there will be a physical impediment to its complete closure, and under such circumstances a person will be able to breathe during suspension, and thus escape death.

A man of the name of John Smith was executed at Tyburn, on the 24th of December, 1705. A reprieve arrived after he had been hanging fifteen minutes. Measures were immediately resorted to to restore vitality. After being bled he recovered. Governor Wall was long in dying, in consequence of which his throat was particularly examined ; a portion of the trachea was found ossified, and this had resisted the pressure of the rope.

During the reign of Henry VI, a woman named Snetta de Balsham underwent the extreme penalty of the law. After hanging for a whole night she was cut down, and found to be still alive. In consequence of her extraordinary escape from death the king granted her a free pardon. Mr Platt, who relates the history of the case in his 'Natural History of Staffordshire,' observes, that her singular preservation was owing to an ossification of the larynx, which allowed the ingress of air to the lungs.

In many of the cases recorded of recovery from hanging, a few of which are well authenticated, there no doubt existed an ossified condition of the larynx.

The most extraordinary instance of recovery after hanging is to be found narrated by Paris and Fonblanque, in their work on 'Medical Jurisprudence ;' it is said to be a well authenticated case. Margaret Dickson, of Musselburgh, was tried and convicted in Edinburgh, in the year 1728, for the murder of her child. Her conviction was accomplished by the evidence of a medical man, who deposed that the lungs of the child swam in water ; there were, however, strong reasons to suspect the justness of the verdict, and the sequel of the story was well calculated to cherish a superstitious belief on the occasion. After execution, her body was cut down, and delivered to her friends for the rights of interment. It was accordingly placed in a coffin, and sent in a cart to be buried at her native place, but the weather being sultry, the persons who had the body in charge stopped at a village called Peppermill, about two miles from Edinburgh, to drink ; while they were refreshing themselves, one of them perceived the lid of the coffin to move, and uncovering it, the woman immediately sat up, and most of the spectators ran away. When taken out of the coffin, a person in the public house bled her, and in about an hour she was placed in bed, and by the following morning she was so far recovered as to be able to walk to her own house, after which she lived for twenty-five years, and had several children.

Death from Drowning.—There are many extremely interesting points connected with this subject, which, however, I shall only be able, in this chapter, briefly to consider.

For what length of time can a person who voluntarily submerses himself remain under water with impunity? In order to give a satisfactory answer to this question, it will be necessary to ascertain how long persons engaged as pearl divers are able to live submersed. It appears that the average time that these men can remain with safety under water does not exceed two or three minutes. Townsend, who has published an interesting account of the pearl divers at Ceylon, refers to the case of one man who was able to be in the water for five minutes. Dr Levevre, who was stationed at Navarino, examined with great care the men who were employed for the purpose of fishing up the treasures of the Turkish fleet, sunk in Navarino harbour. The divers had to plunge 100 feet deep in the water. The Greek divers engaged in this duty, although renowned for their prowess, could not remain, on an average, longer than 76 seconds beneath the water. If they were submersed for two minutes, blood gushed out of the mouth, ears, and nostrils. According to the experience of Mr Marshall, who was for some time surgeon to the forces at Ceylon, pearl divers could not be submersed with impunity for a period exceeding 50 seconds. The divers of the Archipelago, and other parts of the Mediterranean, who dive for sponges, and who are admitted to be the most famous divers in Europe, cannot remain submersed more than 50 seconds. We should, however, remember that the demand for oxygen in the lungs is materially modified by the nature of the food taken into the stomach. It was an observation made by Mr Spalding, the celebrated diver, that whenever he eat much animal food and drank spirituous liquors, he consumed in a much shorter time the oxygen of the atmosphere in his diving-bell; and therefore he had learned, from experience, to confine himself to a vegetable diet and water when following his avocations. The priests or conjurors (*Pillal Karras* in the Malabar language) who attend the divers engaged in the pearl fisheries of the East, enjoin, as a religious duty, an abstinence from all food before he plunges into the stream.*

There is no doubt that habit has considerable influence over the organs of respiration, as well as on other functions. A person has been known to take large doses of poison with impunity, from having, for a long period, habituated the system to the gradual influence of poisonous drugs. In like manner a diver, by long practice, may be able to live without breathing for a time. In diving animals there is a natural provision to enable them to live for some time without air. The chief venous trunks are very tortuous, and admit of dilatation, so that the venous blood can accumulate in them, instead of distending and embarrassing the right cavities of the heart. Dr C. J. B. Williams surmises that a similar change may be produced in divers, by the often-repeated practice of holding their breath. Professor Faraday has pointed out a method by which a person may hold his breath for a minute and a half, which is double the time usually practicable. To effect this object the person must make in succession five or six full and forcible inspirations. By this means the air cells are so well filled that a fresh inspiration is not required for some time. As Dr Williams observes, a knowledge of this fact may be useful whenever a person should want to hold his breath for a time in going into the suffocating atmosphere of a sewer, a mine, a house on fire, or in diving. Dr Paris on this subject cites the case of Mr Kite, who, after making a deep inspiration of 300 cubic inches of air, was enabled to retain this quantity for 72 seconds without a fresh inspiration. The most ridiculously absurd and preposterous stories are related of persons who were able to live for an extraordinary period under water. But these, like many other medical facts, have no existence, except in the imagination of the persons who recorded them. M. d'Egly, member of the Royal Society of Inscriptions, declares that he was engaged to a dinner for which the fish was to be provided by a Swiss diver, who got his living by plunging into the water and pulling the fish out of their holes. The dinner hour arrived, but no fish appeared. Drags were employed, and the diver's body found. The curate wished to bury it immediately, as it had been nine hours under water; but M. d'Egly refused to allow it to be buried, as he wished to resuscitate it. He did so in three quarters of an hour. The Rev. Mr Durham, in his '*Physico-Theology*,' is more credulous than the curé; he quotes Pechlin for the case of a man pensioned by the queen for having joined his fellow-creatures again, after remaining upright under water, his feet sticking in the muddy bottom, for 16 hours!!

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* Dr Paris's 'Medical Jurisprudence.'

Mr Tilesius, the keeper of the Royal Library, has published an account of a woman whom he saw alive and well after having been three days under water. Mr Busmann declares that he heard a funeral sermon at Boness, in Lithovia, upon an old man of 70, who was reported by the preacher to have fallen in the water when 16 years old, where he remained for seven weeks. Mr Brydone was told that one diver called Calas, but undernamed Pesce, could live several days in the sea; and Kircher asserts, that this aquatic person could walk under water from Sicily to Italy!!

The most experienced medical men who have been engaged in the recovery of persons apparently dead from drowning, affirm, that it is seldom possible to restore life if the person has been in the water for a period exceeding five minutes. Such is the result of the observations of Mr Wolley, surgeon to the Royal Humane Society. In the annals of the Humane Society there are recorded many instances of persons who have been resuscitated after having been submersed from twenty minutes to half an hour; but I should much question the accuracy of these published statements; they are opposed to the experience of almost every physician and surgeon who have had opportunities of investigating this physiological point. Life is much more rapidly extinguished when the submersion takes place in water of a low than of a moderately warm temperature. Cold has a powerful sedative influence on the nervous system, and soon destroys vitality. On this account persons who are so unfortunate as to fall in the water during the skating season, are with difficulty restored to life.

In many cases, owing to the mental shock experienced at the moment of submersion, the person faints, consciousness is suspended, and the person does not struggle. In this state life may be retained for a longer period than under other circumstances.

When a person falls into the water in a state of syncope, or in a fit, he is incapable of making any muscular exertions; he does not struggle, consequently he is capable of remaining for a longer period under water than he would be able were he possessed of consciousness. It is well known that the demand for oxygen in an animal body is in proportion to its expenditure by muscular exertions. It has been established by Lavoisier, that a man under ordinary circumstances consumes 1,300 or 1,400 cubic inches of oxygen in an hour; but he discovered that, when he is engaged in raising weights, the consumption is at the rate of 3,200 in the hour. On this principle, the advice given by Holwell to his wretched companions confined in the black hole at Calcutta was extremely judicious, viz., "To be quiet and orderly, and not to exhaust their strength by useless efforts."

Dr Goodwyn has accurately described the phenomena which accompany death by drowning. He observes that, "When an animal is immersed in water, his pulse becomes weak and frequent; he feels an anxiety about his heart, and struggles to relieve it; in these struggles he rises towards the surface, and throws out a quantity of air from his lungs; after his anxiety ceases, his pulse becomes weaker, the struggles are renewed with more violence, he rises towards the surface again, throws out more air from his lungs, and makes several efforts to inspire; and in some of these efforts a quantity of water commonly passes into his mouth; his skin then becomes blue, particularly about the face and lips; his pulse gradually ceases, the sphincters are relaxed, he falls down without sensation or motion."

I have now to describe asphyxia from the inhalation of noxious gases. I have, at the commencement of this article, spoken of the highly deleterious nature of carbonic-acid gas;—charcoal, when ignited, generates this gas, and should a person be confined in a room where pans of it are being burned, death will be the consequence. This gas is also exhaled from lime-kilns, cellars, and places where beer and wine are in a state of fermentation; it is also produced in wells, marshes, and mines; plants, also, evolve carbonic-acid gas. Gardeners who are compelled to remain for some time in hot-houses where a number of plants are collected together, are very subject to painful headaches, in consequence of being compelled to breathe an atmosphere loaded with this destructive agent. On this account, the practice of having plants in apartments where persons are in the habit of sleeping, cannot be too severely censured. The following instructive fact is recorded in the *Times* of October 17th, 1814:—"Mr Sherbrook having frequently had his pinery robbed, the gardener determined to sit up and watch. He accordingly posted himself, with a loaded fowling-piece, in the green-house, where it is supposed he fell asleep, and in the morning was found dead upon the ground, with all the appearance of suffocation, evidently occasioned by the discharge of mephitic gas from the plants during the night."

D'Arcet visited the Grotto del Cano, in Italy, for the purpose of ascertaining the effects of this gas on the system. He, with this object, moved towards the grotto on his hands; he instantly fell flat, and had he not been immediately rescued by the guide, death would have ensued.

Sulphuretted-hydrogen gas is most destructive to human life; it is generated in sewers, and in other places for the reception of filth. This gas is not, however, so pernicious to man as to animals. The men engaged in the common sewers of Paris work with impunity in an atmosphere containing one part of sulphuretted hydrogen in one hundred of air, so that they constantly breathe from twenty-five to ninety thousandths of this gas. "A proportion," says Beck, "of 1-300th is sufficient, in a short space of time, to kill a bird, and 1-800th produced death in a dog; and a horse died after breathing an atmosphere containing 1-250th part of the gas."

Into the practical consideration of asphyxia it will be impossible for me to enter at any length. With reference to the treatment of apparent death from drowning, the first thing to be done is to remove the body to a locality where the means of restoration can be immediately brought into play. The body should be placed in a recumbent posture, with the head and shoulders elevated. After the wet clothes are removed from the body, it should be well dried, and heat be applied. Mr Wolley, surgeon to the Royal Humane Society, recommends the patient to be placed immediately in a warm bath, of the temperature of 98° to 100° of Fahr. Should a bath not be ready, warmth should be applied by means of hot blankets, hot sand, &c.; whilst the body is exposed to the effects of elevated temperature, the lungs should be carefully inflated; the great object is to restore respiration, or the action of the lungs, by artificial inflation. Various instruments have been invented for this purpose, but should these not be at hand, the lungs are to be inflated by the human breath. It is supposed that the atmospheric air is better to effect this object than air which has once been inspired; but the objection is not well-founded: air inspired, and immediately expired, contains only one hundredth part less of oxygen than air that has not passed through the lungs. In inflating the chest the nostrils should be carefully closed; violent inflation of the lungs must be carefully avoided. Goodwyn recommends, for an adult, the injection of one hundred cubic inches of air; but such a quantity cannot be forced into the lungs without danger of injuring the texture of the organ. The most gentle inflation must be practised. Rabbits, goats, and sheep, have been killed by an inflation from the mouth of a human being, so delicate is the structure of the pulmonary tissue. The quantity of air sent into the lungs should amount to that which is naturally inspired; moderate inflation of the chest promotes the circulation through the lungs, whereas violent inflation retards the circulation of the blood, by acting mechanically in compressing the vessels. Independently of these objections, if too great a quantity of air be injected into the lungs, the development of animal heat will be prevented. When insufflation is resorted to, pressure should be made on the chest and abdomen, causing an alternate relaxation and expansion of the chest, in imitation of natural respiration.

In inflating the lungs by means of the mouth, the operator should be careful to close the two nostrils before doing so; should this not succeed, air is to be sent into the chest through one of the nostrils, the other, as well as the mouth, being closed. If a bellows or any other instrument be used, the air should be warmed before it is injected into the lungs. The pipe of the bellows, or any instrument that may be used, is to be inserted into one nostril, after closing the other and the mouth; whilst the lungs are being inflated, friction is to be well applied to the surface of the body, to promote the circulation. Stimulants, such as hartshorn, &c., are to be applied to the nostrils; and frequently the injection of warm stimulating fluids into the stomach, by means of a flexible tube or syringe, is of great service. Mr Wolley has found bleeding of great service,—more so, he observes, than inflation of the lungs. At the Humane Society they have recourse to bleeding immediately after the patient is immersed in a warm bath, of the temperature of 100°. The most persevering and unrelaxing efforts should be made to restore animation under such circumstances. Persons have been known to recover after having, when taken out of the water, laid for the space of an hour to all appearance devoid of vitality. J. Hunter has established the possibility of restoring the action of the heart, even after it has ceased to act. The application of galvanism has been found highly beneficial when all other means have failed. The secondary are sometimes more alarming than the primary symptoms; a person, after being restored to life, may manifest indications of congestion of the brain, and become furiously delirious. When this is the case, great care should be taken of the patient. For the treatment of this affection, bleeding and artificial inflation of the lungs are generally recommended by the faculty, even after animation has been restored. I must reserve what I have to say of the treatment of other kinds of asphyxia for another occasion.

CHAPTER X.

MENTAL PHILOSOPHY CONSIDERED AS A BRANCH OF MEDICAL EDUCATION.

Metaphysical studies have fallen during the last century into general disuse—I may say into a condition bordering upon universal contempt; for in an age when nothing is viewed as important which cannot be applied to the practical purposes of life, conducing to the prosperity of nations and individuals, it is not to be supposed that what is too often considered as little better than the effusions of overheated imaginations, or at best but the tissue of useless definitions, and nice distinctions of terms, could long maintain a place among the useful or ornamental branches of education. Accordingly the study of psychology has been discarded by the *οἱ πολλοι* of our English universities, and only preserved in Scotland, as affording to the philosophical classes abstract subjects for disputation and English composition.

I shall not here enter into an examination of the comparative merits of any system of education, but merely observe, that though it be true that the grand object of all education is mental discipline, and it is a good or bad system in proportion to the rapidity with which this cultivation is effected, and the degree of expansion the mind receives from its influence, and that our present scholastic system fully accomplishes this object by the close and analytical reading required of all who aspire to the honours awarded by our chartered seminaries,—very little beyond this is effected. Other pursuits and studies are grappled with better effect by well trained minds; but the knowledge which has been gleaned with so much care and assiduous study from the pages of antiquity, when brought to bear upon the practical pursuits of life, is found to be almost a dead letter. It does not give the student what he ought to know when, launched upon the world's tumultuous sea, he is called upon to direct the mighty vessel of the state, or to occupy the subordinate, though not less important, situation of dispenser of its laws. For these purposes, much time must be expended in the pursuit of more useful knowledge; whilst that which has been already acquired is almost wholly forgotten, or remembered only for the purpose of adding a few classic embellishments to forensic or senatorial eloquence,—a poor and contemptible recompense for the time which has been consumed in its acquisition.

Modern philosophy has taught that the mind of man is but a barren and uncultivated wild, requiring only the application and care of husbandry to prepare it for any seed. No distinctions are made as to the various capabilities of men, they being thrown with most unphilosophical indiscrimination into the same pursuits, and thus genius is cramped, and the progress of philosophy retarded. As in medicine, no certain rule can be adopted which will apply indiscriminately to all constitutions, but every case presents anomalies, subverting the reasoning drawn from other premises, and requiring a new application of rules and remedies; so the mind of every individual displays a bias towards some particular branch of study, whilst the most unconquerable disrelish is manifested for every other.

My object is to endeavour to draw the attention of the medical philosopher to the study of the human mind in its healthy and morbid state, in order that some useful application of a knowledge of its idiosyncracies, its various diseases, and its influence over the body, may be made in the practice of his profession.

The study of the human mind,—that mighty fabric that raises its possessor to so exalted a state in the scale of creative beings,—has, in all times and ages, held a pre-eminent rank in the estimation of learned men. The progress, however, of this vast and boundless field of interesting but difficult inquiry has not been at all commensurate to the growing zeal with which it has been cultivated. Hitherto, this interesting branch of research has been usurped by schoolmen and metaphysicians, who have capriciously allotted faculties to man, and dictated laws to nature. Disdaining to follow in the illustrious footsteps of the immortal founder of the inductive philosophy,—forming wild and visionary hypotheses,—assuming generalities,—and "torturing the principles to the accommodation of individual phenomena,"—they have brought more discredit on the science of mind, and have excited a greater prejudice for speculations of this nature, than can for a moment possibly be conceived.

Mind and matter are so closely associated, that it is unphilosophical to separate them. We cannot, at any rate, psychologically arrive at a knowledge of mental power abstracted from the organization with which it is connected. "The sensitive organs," says a writer on this subject, "by which we derive knowledge, are parts of the living apparatus; and although we may virtually disunite them for systematic convenience, or for the facilities of instruction, they must be regarded as one united system of reciprocal action and mutual contribution."

Of the utility of metaphysical studies to a person engaged in the study and practice of medicine, there can be but one opinion among the rational and thinking portion of the medical profession. Dr Southwood Smith appears to think that mental science is too much neglected by our profession. He observes, "The degree in which the science of mind is neglected in our age and country,—may it not be justly added, especially in our profession?—that science upon the knowledge of which the conduct of every individual mind is dependent,—is truly deplorable. Medicine is an inductive science, the cultivators of which are peculiarly exposed to the danger of making hasty assumptions and of resting in partial views; yet it is not deemed necessary that a practitioner should be disciplined in the art of induction, or should be cautioned against sources of fallacy in the practice of making inferences." To the man engaged in investigating the *science* of medicine, no preliminary studies can be productive of more real utility than those which tend to call into exertion the latent principles of thought, and that habituate his mind to close, rigid, and accurate observation. To the medical student the possession of these powers must be of incalculable value. The study of mental philosophy thoroughly disciplines the understanding; it gives also precision to language and thought, and induces habits of close attention and patient application of mind. "The highest scientific object," says an able writer, "to which the young can be directed, is mental philosophy, or the philosophy of the human mind;—that science which teaches us the laws of our mental frame, which shows us the origin of our various modes and habits of thought and feeling,—how they operate one upon another, and how they are cultivated or repressed. The well-directed study of it calls into action and improves the highest intellectual faculties: and while it employs the powers of the mind, it suggests the best means for their culture, and the best mode of their direction. It enables us to trace the intricacies of our own hearts, and points out the proper discipline for their correction; it discovers to us the real excellences of the mind, and guides us in our efforts for the attainment of them." The business of education, it has been well observed by a great authority, is not to perfect the learner in any of the sciences, but to give his mind that freedom and disposition, and those *habits which may enable him to attain any part of knowledge himself.* The most valuable part of our knowledge is acquired by the exertions of our *own mind.* The object of tutors and professors is principally to point out to us the *right road* to wisdom, and to excite a spirit of inquiry and observation in those under their care. They may cram the mind with isolated *facts;* but this does not constitute wisdom, using this word in its proper acceptation. At our public seminaries the foundation only is laid; the superstructure we have ourselves to rear. A man may be profoundly acquainted with facts, but may have no just claim to the title of being wise. A man may possess knowledge without wisdom;—the possession of the former does not necessarily imply the existence of the latter. Cowper has made a just distinction between knowledge and wisdom; he says,

> "Knowledge and wisdom, far from being one,
> Have ofttimes no connexion. Knowledge dwells
> In heads replete with thoughts of other men;
> Wisdom, in minds attentive to their own.
> Knowledge,—a rude unprofitable mass,
> The mere materials with which wisdom builds,—
> Till smoothed, and squared, and fitted to its place,
> Does but encumber whom it seems t' enrich.
> Knowledge is proud that he has learned so much;
> Wisdom is humble that he knows no more."—*Task*, Book VI.

If we desire to succeed in any branch of knowledge, we must exert the prerogative of thinking and observing for ourselves. We must not rest satisfied with the opinions of others until, by the exertions of *our own* minds, we have found them to be correct. Lavater, the great physiognomist, exclaimed, whilst looking at the picture of the immortal Hunter, "That man thinks for himself;" and it was this exertion of his own mighty intellect that enabled him to make such a rapid advancement in surgical and physiological science. "I never read," the great Hunter used to exclaim to his class. "This is the book that I study" (showing some part of the dead subject), "and this is the work that you must study if you wish to become eminent in your profession."

"The mind of man," observes Mr Reid, "is the noblest work of God which reason discovers to us; and therefore, on account of its dignity, deserves our study." And the great philosopher Locke also observes, "Since it is the understanding that sets man above the rest of sensible beings, and gives him all the advantages and dominion which he has over them, it is certainly a subject, even for its nobleness, worth our labour to inquire into."

In studying the mind, we have the whole world to look at; for all we know of it is through those very operations of the mind which are the subject of intellectual philosophy. The study also tends very much to the improvement of the mind itself, and makes us better able to apply its powers with success to any other department of scientific inquiry. To the medical man, the study of the mind, its operations, passions, &c., is of the greatest practical importance. As the mind undoubtedly rules the body, unless we have an idea of its constitution, how can we successfully direct its powers with a view to preserve the health of the body? We might as well pretend to negotiate with a foreign nation, without any knowledge of the nature of its government, or those under whose jurisdiction its affairs are conducted.

In that painful affliction, with which we have often to combat,—insanity, or a departure from the healthy condition of mind,—how can we attempt its cure without a knowledge of the mind in a state of *health?* To the individual who directs his attention almost exclusively to the management of the unfortunate insane, the study of the healthy or sound condition of the human understanding is of paramount importance. As well might we attempt to grapple with the diseases of the body without a knowledge of its organization, as to endeavour to manage the different modifications of insanity without an intimate acquaintance with the physiology of the human intellect. "Medical men," says a writer on insanity, "have anxious practical duties, more pressing than any claims of mere mental gratification, and must make their studies subservient to them; but this may with truth be said—that the study of man's understanding requires to be pursued to a certain extent, to enable medical practitioners to perform an important part of their practical duties with credit. Even experience, supposing that they had opportunities of acquiring it, which they have not, would merely impart to them a little practical dexterity—very limited, and very likely to fail them in the greatest need: it is the acquisition of principles of practice which can alone prepare them for the various, the sudden, and the alarming phenomena which demand their attention in this department of medical practice."*

Much prejudice has at all times existed against metaphysical speculations. To call a man (observes a writer) a metaphysician in the present age, is a delicate mode of recommending him to a lunatic asylum; and Dr Armstrong has wittily defined metaphysics to be "the art of talking grave nonsense upon subjects beyond the reach of the human understanding." Indeed, when we come to examine the psychological doctrines of some of the ancient, and even some of the modern writers, we need have no cause for surprise at the disrepute into which this interesting and useful branch of inquiry has of late fallen. Mr D. Stewart attributes this prejudice to two causes. First, from an apprehension that the subjects about which they are employed are placed beyond the reach of the human faculties; and secondly, from a belief that these subjects have no relation to the business of life. Precisely what alchemy is to modern chemistry, ancient metaphysics is to mental science. The object at which alchemy aimed, and the jargon which constituted its only language, do not afford a greater contrast to the exact and useful researches of modern chemistry, and the clearness and precision of its present nomenclature, than the true objects of mental science, and the simplicity of its language, exhibit to the metaphysical speculations of past ages, and the jargon in which the vain disputations they produced were carried on,—a jargon which was at once the easy refuge of ignorance, and the constant source of mental delusion.

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* Dr Conolly. 'Indications on Insanity.'

The object of the ancient metaphysical philosophers was the discovery of the *essence* or *substratum* of matter and mind. Not satisfied with the study of the qualities of matter, or the faculties or operations of the human understanding, they endeavoured to penetrate into the secret recesses of the mental economy, and attempted to unravel the hidden mysteries of man's intellectual mechanism. Notwithstanding, however, they were involved in these uncertain researches, they, (observes Lord Bacon,) in seeking for brilliant impossibilities, sometimes discovered useful realities. Bacon compares the ancient alchemist to the husbandman, who, in searching for a hidden treasure, turns up the soil, and pulverizes the earth, thereby rendering it more fit for the purposes of vegetation. The attempts of the master-minds of antiquity to discover the essence of the human mind, proved unsuccessful. With the illustrious philosopher, we affirm that all we know for a certainty is our own ignorance. The essence of the mind, like the philosopher's stone, remains yet undiscovered.

> " 'Tis but to know how little can be known,
> To see all others' faults, and feel our own."

But it may be asked, ought this consciousness of our ignorance to deter us from indulging in any further speculations on this subject? Owing to an incurable deficiency of data, we can arrive at no satisfactory conclusions concerning the essence of mind; yet we are justified in analyzing its operations or powers; and it is this study of the faculties of the human mind that has given such an elevated character to the researches of some of our modern metaphysical philosophers. Speculations concerning the essence of the mind allow of greater scope for the display of a fertile imagination than for the sober exercise of the reasoning faculty. We know nothing of the essence or substratum of matter which is cognizable to sense; and how can it rationally be expected that we can discover the real nature of that principle which can only be a subject of *consciousness?* We know nothing of the substance that is the basis of either material or spiritual qualities; we know only their being, and reason of their nature from their qualities and sensible effects. We do not know whether electricity, heat, gravitation, &c. be material qualities, or the effects of an immaterial principle superadded to matter. Yet notwithstanding our ignorance of the proximate nature of these principles, we are daily reasoning on their qualities and sensible effects. And this is all we can do in our speculations concerning mind; we must rest satisfied with the more humble and certain inquiry into its operations.

" It certainly cannot be wondered at," says a writer on this subject, "that the human intellect has wandered upon the ocean of uncertainty respecting its own operations and those corporeal functions with which it holds so intimate a connexion, when it is considered that, until the end of the last century, but little care was taken to collect and arrange a requisite number of facts, and to direct the mind to a careful observation and analysis of the extent and nature of its operations. Until our own time, how little anxiety have the majority of philosophers shown to ascertain the stability and connexion of the data upon which they founded their doctrines; and which often led, from the neglect of that precaution, to conclusions irreconcileable with common sense and the experience of our senses."

It was not until the introduction of the Baconian principles of induction that the human mind was studied philosophically. The improvement which took place in this branch of science soon after the publication of the '*Novum Organon*' was most remarkable; it was by following in the steps laid down by the immortal Lord Verulam, that the illustrious Locke was enabled to produce his celebrated work on the human understanding;—that work which has been pronounced the greatest of any age or country. It is no little honour to our profession that two of the greatest metaphysicians that this country has ever given birth to,—Locke and Brown,—were physicians: indeed I cannot conceive of a man more calçulated to investigate the phenomena of mind than he who has previously been engaged in studying the anatomy and physiology of the human frame. We find what we denominate mind, so intimately associated with the body, that it would be difficult to form a proper estimate of the one without a knowledge of the other.

Independently of the practical utility resulting from metaphysical inquiries, the study of the human mind, on account of its exalted nature, is well worthy of our serious attention. In no situation of life will this species of knowledge be unavailing. To the painter, the poet, the actor, the orator, moralist, statesman, and physician, a knowledge of the mind is of the utmost importance; they all operate upon it in different ways, and for different ends, and succeed according as they touch properly the strings of the human frame.

I have now, I think, satisfactorily proved the *utility* of this branch of inquiry. "Whatever progress may be made towards the discovery of truth in this matter, we shall not repent the pains we have taken in it. The use of such inquiries may be very considerable. Whatever turns the soul inward on itself, tends to concentre its forces and to fit it for greater and stronger flights of science. By looking into physical causes our minds are opened and enlarged; and in this pursuit, whether we take, or whether we lose our game, the chase is certainly of service. Cicero, true as he was to the academic philosophy, and consequently led to reject the certainty of physical as of every other kind of knowledge, yet truly confesses its great importance to the human understanding, '*Est animorum ingeniorumque nostrorum naturale quoddam quasi pabulum consideratio contemplatioque naturæ.*' If we can direct the light we derive from such exalted speculations upon the humbler field of the imagination, whilst we investigate the springs and trace the courses of our passions, we may not only communicate to the taste a sort of philosophical dignity, but we may reflect back on the severer sciences some of the graces and elegancies of taste, without which the greatest proficiency in those sciences will always have the appearance of something illiberal."*

By connectnig the science of medicine with the philosophy of the human mind, we are placing the former on the highest vantage ground to which it is susceptible of attaining. The practitioner of medicine ought to be endued with the true spirit of a philosopher. It may be true that it does not require a very expanded or elevated tone of mind in order to enable the physician or surgeon to wield the agents of the *materia medica;* but he who conceives the art of treating disease to consist in the exhibition of medicinals, entertains an ignoble idea of the principles of his profession. Medicine ought not to be practised as a trade, but as a *science.* A physician is not an artizan, but a philosopher; and although he may occasionally have to avail himself of physical agents for the removal of corporeal and mental ailments, the great and important principle of treatment consists in acting upon the body through the medium of the mind. In order to do this effectually, how essentially necessary it is that the medical man should be thoroughly versed in a knowledge of the human understanding, its passions, idiosyncracies, and reciprocities of action. If this view of the matter be correct, the whole system of medical education must undergo an important reformation. Physical truths may enlarge the mind, and are necessary to the philosopher and the man of science; but they will not alone fit the physician for the arduous duties of his profession. He must be educated as a moral and intellectual being. As he will have to make available mental influences in the treatment of disease—to act upon the minds of those for whose benefit he is consulted,—how important it is that his own understanding should be subjected to a very high amount of expansion and cultivation!

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* Burke.

> "He that would govern others, first should be
> The master of himself, richly endued
> With depth of understanding, height of courage."
>
> MASSINGER.

Before entering upon the consideration of the various intellectual faculties, passions, &c. exhibiting their normal and abnormal conditions, and deducing therefrom principles to guide us in their management, I would endeavour to establish how far our knowledge of mental phenomena extends, and to point out the futility of attempting to pass the boundaries prescribed to finite understandings. In the course of this inquiry it will be impossible to avoid alluding cursorily to many points with respect to which much difference of opinion exists. The connexion between mind and matter, life and organization, are topics of absorbing interest; and although these great speculative questions have excited much acrimony in the minds of those who ought to be most free from a feeling of this kind, the struggle has not altogether been unproductive of useful results.

In demonstrating the influence of mind on body, or body on mind, the consideration of the dependence of mental and vital phenomena on a particular kind of organization cannot with propriety be omitted. If the inquiry be productive of no other advantage than that of humbling our pride by exposing our ignorance of the mysterious principle of life, it cannot fail of being attended with beneficial results.

The following points will, *seriatim*, merit consideration:—

1. What is understood by the term mind.
2. The connexion between mind and matter.
3. Materialism considered.
4. Life and organization.

The Latin word *mens*, or mind, which is now used to express in the aggregate all the intellectual operations, signified originally that which knows or understands, and is derived from the root *mena*, to know. The word soul was used by the ancients to express simply the animating principle.

The Celts gave their soul the name of "seel," of which the English have made soul, while the Germans retain *seel*. The Greek philosophers distinguished three sorts of souls:—"Psyche," signifying the sensitive soul—the soul of the senses; and hence it was that Love, the son of Aphrodite, had so much passion for Psyche, and that she loved him so tenderly: "Pneuma," the breath, which gave life and motion to the whole machine, and which we have rendered by "spiritus,"—spirit, a vague term, which has received a thousand different acceptations: and lastly, "nous," intelligence. Thus, according to the Greeks, we have three souls;—Pneuma was spread *throughout the body;* Psyche was in the *breast;* and nous in the *head*.

Prior, the poet, wrote the history of the soul, under the title of "Alma."

The soul, according to "Alma," resides at first in the extremities, in the feet and hands of children, and from thence gradually ascends, at the age of puberty, to the centre of the body. The next step is to the heart, in which it engenders sentiments of love and heroism; thence it mounts to the head at a mature age, where it reasons as well as it is able; and in old age it is not known what becomes of it,—it is the sap of an aged tree which evaporates, and is not renewed again.*

"The notion we annex to the words matter and mind," says Reid, "is merely relative. If I am asked what I mean by matter, I can only explain myself by saying, it is that which is extended, figured, coloured, moveable, hard, rough and smooth, hot or cold; that is, I can define it in no other way than by enumerating its sensible qualities. It is not matter or body which I perceive by my senses, but only extension, figure, colour, and certain other qualities which the constitution of my nature leads me to refer to something which is extended, figured, and coloured. The case is precisely similar with respect to mind. We are not immediately conscious of its existence, but we are of sensation, thought, volition—operations which imply the existence of something which feels, thinks, wills, &c."

Newton was asked, why he stepped forward when he was so inclined, and from what cause his arm obeyed his will? He honestly replied that he knew nothing about the matter. If we were to follow the example of this great philosopher, and modestly admit our ignorance of those subjects about which we really have no knowledge, we should have a just conception of the shallow pretensions of man to universal wisdom. No undertaking would perhaps prove more beneficial to mankind than that which endeavoured to draw a correct line of demarcation between what is really known, and that which is merely conjecture.

Our notion of the nature of mind is as limited as our knowledge of material substances. "When we wish to have a rude knowledge of a piece of metal," says a great French philosopher, "we put it on the fire in a crucible; but have we any crucible wherein to put the soul? Is it spirit? says one; —but what is spirit? Assuredly, no one knows. This is a word so void of meaning, that to tell what spirit is, you are obliged to say what it is not. The soul is matter, says another; but what is matter? We know nothing of it but a few appearances and properties; and not one of these properties, not one of these appearances, can bear the least affinity to thought." If we look into the Mosaic records for information, we should feel inclined to believe the soul to be a kind of divine breath, vapour, or aura, or to have proceeded from such a substance; for "God breathed into man's nostrils the breath of life, and he became a living soul." It is also stated, in another part of the Scriptures, that the blood is the life of man; and a distinction is drawn between mind, soul, and spirit; so that our knowledge derived from the Bible, on this subject, is vague and indeterminate. What do we know of the nature of spirit, mind, or soul? All we know for a certainty, is that we think, reason, judge, that we possess a will, &c.; and a knowledge of these phenomena we derive from consciousness, and we denominate them effects of an undefinable and inscrutable principle, which we designate by the term mind, or soul. Any other word would do equally well to denote the principle which we call mind; but these terms being universally used, and their acceptation generally known, it is not necessary to substitute any other in their place.

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* Prior was originally an attendant at a tavern kept by his uncle, where the Earl of Dorset, a good poet himself, and a lover of the bottle, one day surprised him reading Horace, in the same manner as Lord Ailsa found his gardener reading Newton. Ailsa made his gardener a good geometrician, and Dorset made a very agreeable poet of his vintner.

That the brain is the organ, or medium through which the operations of the mind are made manifest, has become an unquestionable axiom in physiology. It is proved by such an overwhelming mass of evidence, that it has become almost unnecessary to establish the fact. In tracing back inquiry up to the spring-head and source of all volition, it stops at the brain, as the only tangible and legitimate organ of all mental action.*

As we trace the different gradations in the scale of animal creation, we find intelligence increase *pari passu* with a complicated organic nervous structure. Where we can discover no nervous system or brain, there we find the lowest amount of instinct and mental endowment.

We find the brain or spinal marrow united to every part of the body by nerves, which either terminate or originate in the sentient organ. These are the only channels of sensation. If the nervous continuity be destroyed the person becomes immediately deprived of sensation and perception. Divide the nerve of sensation going from the brain to the hand, and you may cut and burn the latter, and no sensation of pain will be felt. Sight is immediately suspended by disease of the optic nerve. A deprivation of the sense of smell and hearing also takes place when the nerves going to the ear and nose are prevented from conveying impressions to the sensorium. The slightest pressure on the substance of the brain deprives an animal of sense and motion, and in man suspends the operations of the mind. If venous, instead of arterial blood, be sent to the brain, asphyxia immediately results. This close relationship between the intelligent principle and the brain has given rise to much controversy respecting the independent existence of mind. Many have maintained that the mental faculties are as much the result of the organism of the human brain, as digestion is the effect of a particular conformation of matter denominated the stomach, and that it is absurd to conceive that the mind can exist as an abstract essence. Those who endeavour to establish an identity between organic nervous structure and mental phenomena overlook the important fact that the brain has been most seriously injured without producing any interruption to its manifestations. Dr Ferrier † adduces a variety of instances, in which the brain was partly or wholly destroyed, where the mind did not suffer any diminution of power.

Dr Abercrombie relates the case of a lady, in whom one-half of the brain was reduced to a mass of disease, but who retained all her faculties to the last, except that there was an imperfection of vision, and had been enjoying herself at a convivial party at the house of a friend, a few hours before her dissolution. Dr Ferrier refers to the case of a man who expired suddenly, and who retained to the last moment a perfect use of his intellect. After death it was found that half his brain was destroyed by suppuration. A man mentioned by Halaran suffered such a severe injury of the head that a large portion of the bone was removed on the right side, and extensive suppuration taking place, there was discharged at each dressing through the opening, an immense quantity of matter mixed with large masses of the substance of the brain. This went on for seventeen days, and it appears that nearly one-half of the brain was thrown out mixed with the matter; but the man retained all his intellectual faculties to the very moment of dissolution, and, through the whole course of the disease, his mind maintained uniform tranquillity.*

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* In all the inferior orders of the animal creation, where instincts are multiplied, while the indications of intellect are feeble, the organ which performs the office of the brain is comparatively small. The sensitive existence of these animals appears to be circumscribed within the perceptions of the moment, and their voluntary actions have reference chiefly to objects which are present to the sense. In proportion as the intellectual faculties of animals are multiplied, and embrace a wider sphere, additional magnitude and complication of structure are given to the nervous substance which is the organ of those faculties. The greater the power of combining the ideas, and of retaining them in the memory, the greater do we find the developement of the cerebral hemispheres. These parts of the brain are comparatively small in fishes, reptiles, and the greater number of birds; but in such *Mammalia* they are expanded in a degree proportional to the extent of memory, sagacity, and docility. In man, in whom all the faculties of sense and intellect are so harmoniously combined, the brain is not only the largest in its size, but beyond all comparison the most complicated in its structure.

† 'Philosophical Transactions of Manchester.'

Although ready to admit a very close relationship between the brain and operations of the mind, these facts, independently of *à priori* reasoning, are sufficient to convince the most sceptical that the mental principle is not the effect of nervous organization.

Dr Priestley is the great advocate for the materiality of the mind. He rejects the commonly received notion of matter, as an absolutely impenetrable, inert substance, and premising that the powers of sensation, perception, thought, have never been found but in conjunction with a certain organized system of matter, maintains that these powers necessarily exist in and depend upon such a system. In proof of this doctrine he alleges that perception and thought are not incompatible with the properties of matter, considered as a substance exalted and endued with the powers of attraction and repulsion; and, therefore, if one kind of substance be capable of supporting all the known properties of man, true philosophy, which will not authorize us to multiply causes or kinds of substance without necessity, will forbid us to admit the existence of any principle essentially from matter. He boldly asserts that " there is the same reason to conclude that the powers of sensation and thought are the necessary result of a particular organization, as that sound is the necessary result of a particular concussion of air." It has been well argued by the learned Dr Barclay, in opposition to the views of Dr Priestley, that if you admit that vital phenomena depend on organism for their existence, by parity of reason we ought to demonstrate that the genius of an artist depends both for its vigour and existence on the nature of his tools. If the vital phenomena cannot be displayed but through the medium of a visible structure, so neither can the genius of the artist but through the medium of those tools which are absolutely essential to the execution of his designs. If the mental principle appear and disappear just in proportion to that state of the organs necessary to its existence, so will also the designs of the artist. As tools imply the previous existence of life in the person who formed them, so all the organisms to be found in the animal and vegetable kingdom as necessarily imply the previous existence of vital phenomena.

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* As to the sensibility in those parts of the brain supposed to be the seat of the intellectual faculties, Sir Charles Bell observes, that we ought not to expect the same phenomena to result from the cutting or tearing of the brain, as from injury done to the nerves. The function of the latter is to transmit sensation, that of the former is higher, and this is inferred from its being insensible. " If on examining the structure of the brain," says this eminent physiologist, " we find a part consisting of white medullary striæ, and fasciculated like a nerve, we should conclude, that as the use of the nerve is to transmit sensation, such tracks of matter are media of communication connecting parts of the brain. If masses are found in the brain unlike the matter of the nerves, and which yet occupy a place guarded as an organ of importance, and holding evidently important relations, we may presume that such parts have uses different from that of merely conveying sensation; we may rather look upon such as the seat of the higher powers. I have found," continues the same authority, " at different times all the internal parts of the brain diseased, without loss of sense, but I have never seen disease general on the surfaces of the hemispheres without derangement of the mind. If I be correct in this view of the subject, then the experiments made upon the brain tend to confirm the conclusions which I should be inclined to draw from anatomy, viz.—that the cineritious and superficial parts of the brain are the seat of the intellectual functions."

Those who contend mind and life to be the result of organization, ought to explain in what manner the organization itself took place; they should show the means employed to produce the disposition of parts which they conceive requisite to give rise to intelligence. If they deny the primary influence of a vital power associated with the particles of matter, let them explain by what other agency the atoms can assume organic actions. All effects must have a cause, and it is better to assign one according to which difficulties can be accounted for, than to contend for the efficacy of properties or powers, of the existence of which we have no evidence, and which, even granting them to exist, can only be considered as inferior agents, or peculiar manifestations of a vital principle.* An unanswerable argument against the materialists may be deduced from the Mosaic account of the creation of man. It is recorded in the Old Testament, that, after God created man out of the dust of the earth, he "breathed into his nostrils the breath of life, and he became a living soul." If life had depended upon organization, the principle of vitality would have manifested itself in proportion as the body became an organized structure.†

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* Richerand.

† The brain has been attentively examined, but no analogy can be most distantly traced between the anatomy and function of the organized mass. Philosophers, with more zeal than judgment, have sacrificed their time and health to the study of the minute anatomy of the brain, hoping to discover the connexion between its structure and uses, but with little success. It has been recorded of the learned Goltz, that he devoted all his life with a sort of enthusiastic madness to the study of the brain. His biographer thus speaks of him:—"Mr Herman Goltz passed many years in anatomical examination of that delicate viscus, the brain, endeavouring to discover some coincidence between its marvellous structure and its important uses. To this end, the whole concentrated force of his acute intellect was directed. Sometimes he was elevated by the hope that he had ascertained the source of the reasoning faculty, and the seat in which the passions are hatched; but these gleams of success were transient, and were succeeded by total obscurity. At one period, he conceived that he had actually drawn aside the curtain, and beheld the mysterious processes that are performed in the occult laboratory of nature; but he confessed himself deceived, and afterwards cordially acknowledged that the curtain itself was a mere delusion. Exhausted by these sudden alternations of hope and disappointment, the fabric of his understanding gave way, and in a moment of despair, he hanged himself in his dissecting-room, and was nearly devoured by the rats before his loss was discovered and his fate deplored. Before he accomplished his last resolve, he wrote on a slip of paper these impressive words: 'For more than *twenty tedious years* I have pursued a phantom, an *ignis fatuus*, that has decoyed me into ruin and misery. My vision has become so dim, that I can no longer distinguish the objects of my research; my hand is too tremulous to hold the scalpel. Confined in this charnel-house, I have been estranged from nature's fair and inviting prospects; I have cultivated no man's friendship, nor sought for the affection of woman. I have indeed read of the charms of society, the exhilarations of wine, the delight of a domestic partner, and the blessedness of

Those philosophers who are so anxious to ascribe every thing to matter, should recollect, that no species of organism, to be found in the animal or vegetable kingdom, or even among the works of art, has ever been known actually to exist where vital phenomena had not preceded, exhibiting itself either within the organism, or in some other organism endowed with life. It seems to be, therefore, not only a natural, but a necessary conclusion, that so far is organism from being the cause, that it is rather the effect of vital phenomena; and hence it follows, that the materials of food and drink, like the kind of materials composing an automaton, may enter into thousands and myriads of structures, having no more concern in regulating the size, proportions, or forms, than the timbers and metals have in devising the plan of a ship, a church, or a palace, into which they may enter with all their chemical affinities, but must enter merely as the materials, and not as the architects or the contrivers.*

The materialist should demonstrate to us how a particular combination of nervous or cerebral fibre can originate judgment, hatred, remorse, self-love, pride, &c. If these mental operations are but the consequence of a peculiar arrangement of brain, this organ must be constantly undergoing structural alterations. When the actor, in the exercise of his profession, assumes the semblance of any passion, when he "mimics sorrow when the heart's not sad," does that portion of the brain supposed to be the seat of the mental emotion become changed?—it must, if the doctrine of those who advocate the supremacy of organization be assented to. In opposing, as I am disposed to do most strenuously, the material philosophy, I would guard myself from falling into the other extreme of denying the close association existing between the mental and corporeal economy. For wise purposes this union is established, and it is the knowledge which we derive from its contemplation that it is my anxious wish to see made available in the practice of medicine. In tracing this connexion between mind and matter, our understanding becomes enlarged, our sphere of observation extended, and our notions of the wisdom and beneficence of the Deity elevated; then surely this inquiry, independently of its great practical utility, cannot fail in improving our intellectual and moral nature.

Many materialists, not satisfied with maintaining that mind is the effect of organization, assert that when the corporeal organs cease to be endowed with vitality, the intellectual faculties become also annihilated. Persons so disposed to reason, should bear in mind that we know of nothing which admits of destruction; that what is termed annihilation is only a change in the mode of existence. The death of the body is nothing more than a change in the arrangement of its constituent elements; for it can be demonstrated, on the strictest principles of chemistry, that not one particle of matter ceases to exist. "There is, therefore," says Dr Brown, "in the very decay

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children: but I have been a solitary student; water has been my only beverage; no females can reproach me with attachment, nor can a child curse me for existence. To live longer is useless; the past has been misemployed; the present is wearisome, and I will anticipate the future.'" Thus ended the melancholy life of Goltz!

* An argument often used against the materialist is that derived from the *divisibility* of the principle of life. In the polypus the sentient principle is divisible; and from one polypus or earth-worm may be formed two or three, all of which become perfect animals, endowed with sensation and volition. It should be borne in mind, that the *Annelida* consists of a frame-work composed of a series of horny bands or rings. At each ring there is a ganglion or little brain, which is the centre of nervous secretion. If this be uninjured when the animal is divided, a separate worm is formed.

of the body, an analogy which would seem to indicate the continued existence of the thinking principle, since that which we term decay is itself only another name for continued existence." It may be true that our idea of spirit, as distinct and unassociated with matter, is far from being clear, but our evidence of the independent existence of mind *per se* rests *primâ facie* upon evidence as strong as that which establishes to our mind the reality of matter.

The subject of life, human, animal, and vegetable, has occupied the attention of speculative minds from the earliest periods of philosophy. The facts which have been brought forward, the theories that have been broached, in order to account for the unknown principle that appeared to be diffused through the universe, and which gave origin to animation, have been numerous, wild, and contradictory. The apparent analogy which existed between the vitality of plants and animals, led them to suppose that the principle of life was identical, and that the form it assumed was owing to the media through which it was made manifest, or to the organic structure with which it was associated.

Overlooking the opinions of the ancients, let me glance shortly at some of the modern notions concerning the origin of the vital principle. Fray, an eminent physiologist, rejecting the idea of the independent existence of life, believed that heat, sunshine, moisture, and mud, when acting together harmoniously, could produce living beings, although he never, like Paracelsus, endeavoured to show how this was effected. He conjectured that life and organization resulted from atoms in the form of light, which proceeded from the sun. He asserted that the sun is hourly decreasing in magnitude, and that when its matter is exhausted, darkness will succeed, and no power being left to retain the planets in their orbits, they must rush together, become again a general chaos, and this second chaos the source of a new order of things. Leibnitz, Haller, Bonnet, Spallanzani, Priestley, Leeuwenhoek, Claude, and Cardinal Polignac, have, like many ancients, ascribed life to various species of organized atoms which have waited for thousands of years for favourable circumstances to enable them to expand into animals or plants: Leibnitz attempted to account for life by supposing the existence of monads, or substances distinct from matter, which have within themselves the power of generating motion, perception, &c. The theories of Haller, Needham, Buffon, Harvey, &c. are exceedingly ingenious, but they in vain endeavoured to chase away the darkness in which this mysterious subject is enveloped. It is sufficient for our purpose to know that superadded to the physical structure of man, animals, and vegetables, is a principle which preserves identity, and causes growth, motion, sensation, &c.; what its nature is, how it operates, and how connected with matter, will perhaps never be revealed to the mind of man. Death is said to be the extinction of vitality, and health is supposed to exist in proportion as this principle pervades the human frame. We see life remain dormant for years in seeds, in the egg it also has no sensible existence until generated and called into being by the application of heat; we know that some animals remain torpid for a considerable time, destitute alike of motion and sensation, who are restored to vitality on the return of a particular season of the year. Do these facts admit of a satisfactory solution? Is it possible, with our limited faculties and imperfect knowledge, that we can solve the problem that has puzzled the wisest philosophers of ancient and modern times? In attempting to discover the origin of our being—the source of vitality—much valuable time has been consumed, that might have been usefully devoted to the study of its laws and operations. It might perhaps be more in consonance with the taste of many were I to develope some fine-spun, ingenious theory of life, or descant upon the hypotheses of others; although I might talk of primitive germs, monads, organic particles, invisible atoms, until the mind became lost in a maze of hard, unmeaning, pedantic terms, no practical good would result from my labours. Probably one useful lesson might be learned from such a history of this branch of speculative philosophy,—it would demonstrate to us the folly of endeavouring to fathom the inscrutable and mysterious workings of the Divine mind; it would teach us humility, and subdue the lofty pretensions of those who in the ardour of their enthusiasm are apt to conceive themselves endowed with a portion of Divinity itself.*

"In every department of human knowledge, there is a point where inquiry must rest; and where it becomes the true philosopher to contemplate in awful humility, the wonders of Almighty power, adoring in silent reverence that infinite wisdom which has only unlocked, as it were, to man, the vestibule of the great temple, that contains thousands of nature's secrets yet unopened, and thousands more perhaps never to be revealed."

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* The most modern theory of life is that which endeavours to establish an identity between it and electricity. There is no doubt but that electricity has a great influence over the body, and that when the supply of nervous energy is cut off from the brain to a particular organ, that organ may be enabled to exercise its functions by exposing it to an electric current. But this only proves that the electricity acts as a stimulant. Is it possible out of the body, by means of this agent, to imitate the process of digestion, nutrition, &c.? The nervous energy may be somewhat allied to electricity, but this fluid which is supposed to be generated in the brain, and distributed through the frame by the nerves, is but the *effect* of vitality, and not life itself.

CHAPTER XI.

OF MENTAL INFLUENCES IN THE PRODUCTION OF DISEASE.

There is no subject within the whole range of medical literature so little investigated, and, consequently, so little understood, as the influence of the mind and passions in the production and aggravation of disease. It is a subject not merely of speculative, but of practical importance, and is as replete with interest to the physician as to the metaphysician and moralist. Hitherto medical writers have paid but little attention to the influence of the intellectual over the *material* portions of our nature; satisfied with a knowledge of the *physical,* they have too much neglected the mental or moral causes of disease.

Experience, our only sure guide in medical inquiries, instructs the physician that a diseased condition of the body produces an alteration in the condition of the mind, and that certain emotions of the soul, whether of a pleasurable or painful nature, are universally attended with reciprocal alterations in the bodily functions. Descartes observes, that the soul is so much influenced by the constitution of our bodily organs, that if it were possible to find out a method of increasing our penetration, it should certainly be sought for in medicine. The connexion between the body and mind is, in fact, so strong, that it is difficult to conceive how one of them can act, and the other not be sensible, in a greater or less degree, of that action. The organs of sense, by which we acquire all our ideas of external objects, when acted upon, convey the subject of thought to the nervous fibres of the brain; and while the mind is employed in thinking, the part of the brain is in a greater or less degree of motion; a large quantity of blood is transmitted to the brain, the action of the arteries becomes increased, and the nervous system sensibly affected.

Plato has remarked, with reference to the influence of the mind on the corporeal frame, "Where the action of the soul is too powerful, it attacks the body so powerfully that it throws it into a consuming state; if the soul exerts itself in a peculiar manner on certain occasions, the body is made sensible of it, for it becomes heated and debilitated. An Italian physician also observes on this subject, that the union of the soul with the body is so intimate, that they reciprocally share the good or evil which happens to either of them. The mind cannot put forth its powers when the body is tired with inordinate exercise, and too close application to study destroys the body by dissipating the animal spirits which are necessary to recruit it.*

The knowledge of the influence of the passions of the mind over the bodily functions, is of ancient date. Plato, in his '*Timæus,*' states it as his firm conviction, that the spirit exerted a marked influence in producing disease. This opinion was afterwards revived by Helmont, Hesper Dolœus, and Stahl; the latter plainly says, that the rational soul presides over and directs the animal functions. In this doctrine he was followed by Nichols, in his '*Anima Medica.*' According to the doctrines of Stahl, the disorders of the body proceed principally from the mind; and, according as it is variously affected, it produces different effects (diseases). Hence, when the mind, which animates the most robust and best organized body, is violently agitated by fright, rage, grief, vehement desire, or any other passion, whether sudden, or attended by long and painful sensations, the body manifestly suffers, and a variety of diseases, as apoplexy, palsy, madness, fever, and hysterics, may be the consequence. If this be true, an attention to the regulations of the mind is of much more importance than physicians seem disposed to admit.

Man is compounded of a soul and body, so closely united, not *identified*, that they frequently struggle and occasionally overpower each other. Sometimes the mind ascends the throne and subdues, in a moment, the physical energies of the most powerful of her subjects. At other times the body gains the ascendancy, and lays prostrate before her the mightiest of human intellects. Instances illustrative of both propositions are of daily occurrence. It has been said of Sophocles, that being desirous of proving that at an advanced age he was in full possession of his intellectual faculties, he composed a tragedy, was crowned, and died through joy. The same thing happened to Phillippides, the comic writer. M. Juventius Thalma, on being told that a triumph had been decreed to him for having subdued Corsica, fell down dead before the altar at which he was offering up his thanksgiving. Zimmerman, in his work on 'Experience in Physic,' has related the circumstance of a worthy family in Holland being reduced to indigence; the elder brother passed over to the East Indies, acquired considerable fortune there, and returning home presented his sister with the richest jewel; the young woman, at this unexpected change of fortune, became motionless and died. The famous Forquet died on being told that Louis XIV. had restored him to his liberty. It is also related of Diodorus Chronos, who was considered as the most subtle logician of the time of Ptolemy Soter, that Stilbo, one day, in the presence of the king, proposed a question to him, to which he was unable to reply. The king, willing to cover him with shame, pronounced only one part of his name, and called him *ονος*, ass, instead of Chronos. Diodorus was so much affected at this as to die soon afterwards. Many old people, upon hearing the news of the restoration of Charles II. died suddenly of joy. The door-keeper of Congress, an aged man, died suddenly immediately after hearing the capture of Lord Cornwallis's army. After the celebrated battle of Princeton, during the American revolutionary war, a number of soldiers were found dead on the field, without any marks of wounds or violence upon their bodies. Their deaths were supposed to have been occasioned by violent mental emotions.

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* Rammazini.

Perhaps there is not a more remarkable instance on record showing, in a melancholy though forcible light, the dominion of mind over the material frame, than the circumstances which attended the death of John Hunter. This distinguished surgeon and physiologist died in a fit of enraged passion; and, what is somewhat extraordinary, he had often predicted that such excitement would prove fatal to him. He died at St George's Hospital, Oct. 16, 1793, under these circumstances: being there in the exercise of his official duty as surgeon, he had a warm dispute with Dr Pearson on a professional subject; upon which he said, " I must retire, for I feel an agitation which will be fatal to me if I increase it." He immediately withdrew into an adjoining room; but Dr Pearson, not being willing to give up his argument, followed him, which so annoyed Hunter, that he vehemently exclaimed, " You have followed me on purpose to be the death of me! You have murdered me!" and instantly fell and expired! Mrs Byron, the mother of the noble bard, is said to have died in a fit of passion. Mr Moore, in his 'Life of Lord Byron,' in speaking of Mrs Byron's illness, says,—" At the end of July her illness took a new and fatal turn; and so sadly characteristic was the close of the poor lady's life, that a fit of ague, brought on, it is said, by reading the upholsterer's bills, was the ultimate cause of her death." A somewhat similar circumstance is recorded of Malbranche. The only interview that Bishop Berkley and Malbranche had was in the latter philosopher's cell, when the conversation turned upon the non-existence of matter, and Malbranche is said to have exerted himself so much in the discussion that he died in consequence. Sanctorius relates an instance of a famous orator, who so far exerted his mind in delivering an oration that he became, in a few hours, quite insane.

The effect of a too close application of mind to study on the bodily health has long been a matter of common observation. The Roman orator, Cicero, points out forcibly the dangers arising from inordinate exertion of mind; and he has laid down some rules for guarding against the effects of study. M. Van Swieten, in alluding to this subject, relates the case of a man whose health was severely injured, by what he calls " literary watchings." Whenever he listened with any attention to any story, or trifling tale, he was seized with giddiness; he was in violent agonies whenever he wanted to recollect any thing which had slipped his memory; he oftentimes fainted away gradually, and experienced a disagreeable sensation of lassitude. Rousseau has very justly remarked, that excessive application of mind " makes men tender, weakens their constitutions, and when once the body has lost its powers, those of the soul are not easily preserved. Application wears out the machine, exhausts the spirits, destroys the strength, enervates the mind, makes us pusillanimous, unable either to bear fatigue or to keep our passions under."*

Shakspeare appears to have formed a just conception of the great injury which the corporeal frame experiences from a too close application of mind. He observes,—

——" Universal plodding poisons up
The nimble spirits in the arteries;
As motion and long-during action tires
The sinewy vigour of the traveller."

Love's Labour Lost.

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* Preface de Narcisse Œuvres Diverses, t. 1, v. 172.

In the 'Consultations of Wesper' we find related the history of a young man of family, 22 years of age, who, having applied himself incessantly to intense mental exertion, was seized with a fit of insanity, in which fit he wounded several persons and killed his keeper. Catalepsy has been known to have been produced by great mental application. Fomelius gives us a remarkable instance of it. A man (says he) who passed whole nights in writing and studying, was suddenly attacked with a fit of catalepsy: all his limbs stiffened in the attitude he was in when the disease first seized him. He remained upon his seat, holding the pen in his hand, and with his eyes fixed on his paper, so that he was considered to be still at his studies, till being called to, and then shaken, he was found to be without motion or sensation.*

Many extraordinary instances are on record, of remarkable changes having been produced in birds by an affection of the animal passions. The following fact is related by Mr Young, in the 'Edinburgh Geographical Journal:'—A blackbird had been frightened in her cage by a cat; when it was relieved, it was found lying on its back, quite wet with perspiration. The feathers fell off, and were renewed, but the new ones were perfectly white. Some similar facts are recorded in a popular periodical. A remarkable change of colour in a lark, belonging to Dr Thomas Scott of Fanish, occurred under my own eyes, and which, I have no doubt, was produced by *grief* at being separated from a mavis. Their cages had long been side by side in the parlour, and often had they striven to outrival each other in the loudness of their song, till their minstrelsy became so stunning, that it was found necessary to remove the laverock to a drawing-room above stairs. The poor bird gradually pined, moped, and ceased its song; its eyes grew dim, and its plumage assumed a dullish tint, which, in less than a fortnight, changed to deep black. The worthy physician watched with the eyes of a naturalist this phenomenon; but, after a while, fearing for the life of his favourite, he ordered it to be replaced alongside of its companion. In a short time it resumed its spirits and song, but after every moulting the feathers were of the same black colour.†

A similar phenomenon has been observed in the human species, who have been exposed to the effects of inordinate passion. Borrelli relates the case of a French gentleman, who was thrown into prison, and on whom fear operated so powerfully as to change his hair completely grey in the course of one night. Dr Darwin ascribes this phenomenon to the torpor of the vessels which circulate the fluids destined to nourish the hair.

Predictions of death, whether supposed to be supernatural, or emanating from human authority, have often, in consequence of the poisonous effects of fear, been punctually fulfilled. The anecdote is well attested, of the licentious Lord Littleton, that he expired at the exact stroke of the clock, which, in a dream or vision, he had been forewarned would be the signal of his departure. In Lesanky's 'Voyage round the World,' there is an account of a religious sect in the Sandwich Islands who arrogate to themselves the power of praying people to death. Whoever incurs their displeasure, receives notice that the homicide litany is about to begin, and such are the effects of the imagination, that the very notice is frequently sufficient with these people to produce the effect.

Numerous other instances might be cited, illustrative of the fatal effects of inordinate indulgence in passion, but I am convinced that the cases already referred to will be sufficient to establish the importance of the subject.

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* Pathol. lib. 3, cap. 2, Oper. Omm. p. 406.

† 'Mirror of Literature' for April 19, 1831.

It is difficult to say which organ is most affected by the passions. No organ or part of the body is placed beyond their influence. Sudden joy or grief will immediately affect the stomach, and destroy all sensations of hunger. Mr Abernethy says, in allusion to this subject,—" You may daily see the affections of the mind, as perplexity, fear, anxiety, and grief, never fail to disorder the functions of the stomach and bowels. You must have noticed how much the cerebrum influences the stomach, and the stomach the cerebrum. *You may consider this subject one of the greatest importance in the practice of your profession.*" The passions act powerfully upon the uterine system, the hepatic, vascular and nervous systems; in fact, when we consider the close relationship existing between the two systems, and the dependence of organic action upon the state of the nervous fluid, we need not be surprised at the structural and functional derangements which so often result from violent mental emotion. Every part of the body is connected to the brain and spinal marrow by the medium of nerves; therefore any agitation of mind, producing an affection in the origin of the nervous system, must necessarily give rise to more or less derangement of the numerous organs of the body. The nerves are the channels through which all moral emotions travel. Anger frequently deranges the liver to such a degree as to give rise to jaundice. Spasmodic and convulsive affections frequently owe their origin to an affection of the imagination. Georget states that the causes which tend to derange the organization of the brain by the exercise of its own functions, are the most frequent. This is demonstrated by the tables published by various authors, as Professor Pinel, M. Esquirol, &c. The passions may be divided into those that rouse and those that depress the powers of life. Fear, love, anxiety, and all the depressing passions, ought to be carefully avoided by those labouring under diseases, either caused by a debilitated state of the constitution, or in which debility is the principal symptom. These passions act by exhausting the nervous energy, and, therefore, must materially weaken the organic functions, as their healthy state depends upon the proper supply of that principle. Therefore, in those maladies which depend upon a low state of the nervous system, nothing acts so beneficially as stimulus applied to the mind. Its effect upon the physical health is astonishing. Mr Madden, in the account of his travels to the East, says, " In Alexandria I have seen whole troops of negro soldiers carried off after a few days' illness, from the effects of cold. In this mortality, however, moral depressing causes had much to do; the Arab had no resource within himself to resist a hardship of which he had no previous knowledge; the negro had no moral courage to invigorate or revive him when the change of climate made him sick, or the sea-breeze made him shiver; and nothing but the strong exertions of mental energy can counteract the ill effects of a vicissitude of climate on the feeble frame of man. In my own practice among Europeans, I have had painful experience of the fatal effects of mental exhaustion, of irritability of temper, and of timidity of spirit."

Those predisposed to inflammatory complaints, to apoplexy, and other diseases arising from, or aggravated by, a plethoric state of the constitution, should carefully avoid all the exciting passions, such as anger, fright, terror, &c., which excite an inordinate action of the nervous system. Inflammatory fevers, apoplexy, hæmorrhage, and local inflammations, have been known to arise in consequence of great mental excitement. On the other hand, typhus fever, intermittent fever, and other maladies, depending for their existence on a low state of the vital powers, are aggravated by those passions which depress the nervous system. It is the *abuse* and not the *use* of the passions that act thus injuriously on the constitution. While the impressions made upon the nervous system by the passions are moderate, and restrained within due bounds—when there is a natural gratification of the passions, guided and controlled by reason, the effect produced upon the system is rather of a beneficial than a pernicious nature. The passions strengthen muscular motion, give an impetus to the circulation, increase the natural secretions, and promote the health and life of the individual. But when the pain excited by the passion is either too strong and violent, or not moderated or overruled by reason, such a violent and continued stimulus will drive too great a quantity of blood to the stimulated organ, by which the vessels will be overcharged, and disease be the consequence.

I have alluded in a previous chapter to the influence of the imagination of the mother on the health of her offspring. As this subject is one of great importance, the reader will excuse me for again reverting to it.

The origin of the belief of the influence of the imagination appears to be coeval with our earliest records. Hippocrates, who was a firm believer in the influence of the imagination of the mother, saved by his testimony a noble woman, who had been charged because she had borne a coloured child (the then husband being white), by alleging that the darkness of its colour was the effect of a picture of an Ethiopian, which hung in her chamber, and which was often the object of her contemplation. Galen was also of opinion that a picture was sufficient to give a corresponding appearance to the fœtus in utero. Cœlius Rhodius informs us, that Fabius Quintilian saved a woman from suspicion after she had brought forth a little negro, by his assertion that the circumstance arose from her taking great pleasure in viewing the picture of a negro suspended in her chamber, and which was supposed to act through the medium of the imagination on the child.

It was the prevalence of this popular belief that gave origin to the first and perhaps most beautiful novel ever penned; it is called 'The Lives of Theagenes and Characlea,' by Heliodorus. Characlea was born white from Ethiopian parents, and her white colour was attributed to the influence of her mother the Queen's imagination, she having viewed during her pregnancy the picture of Andromeda, which was painted with a white face. That the belief in the influence of the imagination over the body is of very high antiquity, appears from the account preserved in the sacred writings of the contrivance which the patriarch Jacob is represented to have employed, in order to augment the number of calves, lambs, and kids, which according to the agreement between Laban and him were to fall to his share. Jacob is said not only to have placed rods of trees in part stripped of their bark, so as to appear spotted, but also to have placed spotted lambs before the flock.* The tyrant Dionysius, who was deformed himself, in order that he might have a comely issue, is said to have always had a beautiful picture set before his wife in the bed-chamber, that by the force of fancy and imagination, she might conceive the likeness of it. It appears that this notion of the influence of the mother's imagination was most general among the ancients. Galen, in his Epistles to Piso, remarks that the ancient Greeks and Romans, in order to have beautiful children, took especial care that the mother should behold agreeable pictures only, beautiful statues, and other objects fitted to excite the most pleasing and delightful mental images. The poet Hesiod entertained a notion that the condition of the father's mind influenced in a great measure the health of his children.

With regard to the connexion supposed to exist by the ancients between the brain of the mother and her fœtus, Malbranche has some curious observations. Malbranche applied this doctrine of communication to explain the general resemblance which the offspring bears to the parents. He says that infants in the womb have the same notions with their mother, labour under the same passions, see the same things, and have the same thoughts. This doctrine of communication between the mother and infant, and the influence of the imagination of the mother on the fœtus in utero, has been revived in modern times by the late Sir Everard Home. This anatomist and physiologist, in a Croonian lecture delivered before the Royal Society, Nov. 18, 1824, 'On the Existence of Nerves in the Placenta,' endeavours to prove that there is a connexion between the brain of the mother and that of the fœtus, by the medium of nerves. "Now that it is known," says Sir Everard Home, "by the discovery of nerves in the placenta, that the brain of the child, as well as every part of the body, is connected by the medium of nerves, we are led to understand the degree of dependence in which the fœtus is kept during the whole time of utero-gestation. Till this discovery was made (continues Sir E. H.) we had no mode of estimating the influence that could be produced upon the child, by the affections of the mind or body of the mother; and therefore the instances that have occurred were considered as idle stories or accidental occurrences, for which no satisfactory reason could be assigned; and this upon no better ground than that they do not always take place under similar circumstances, which nothing connected with nerves ever does. That they do sometimes occur, no one will be so hardy as to deny, and when they do, we cannot now be at a loss for a mode of accounting for their doing so." In confirmation of this opinion, the author proceeds to relate several well-authenticated cases, in which the mind of the mother has sensibly affected the fœtus in utero. If a nervous communication between the brain of the mother and that of the fœtus be satisfactorily proved to exist, there would be, in my opinion, no difficulty in proving, beyond a doubt, that any great mental agitation of the mother must *necessarily* affect the condition of the fœtus. If the arteries depend for their action on a supply of what is called nervous energy, the arteries in the placenta must also have transmitted to them a supply of the same principle, in order to enable them to perform their healthy functions. Every idea which enters the mind must produce an action more or less in the nervous system. Sensations must be transmitted by the nerves to the sensorium, in which organ perception takes place. The action in the nervous system is in proportion to the *nature* of the idea which enters the mind. If an irritable, nervous woman, in a state of pregnancy, be agitated by any frightful idea, a violent commotion takes place in the nervous system; and if the statement of Sir Everard Home be correct, regarding the nervous communication between the mother and child, there cannot be much absurdity in supposing that a violent agitation of the mind of the mother should cause a corresponding affection of the nervous system of the fœtus: and as the due and healthy action of the arteries which deposit the nutritious matter depends upon the state of the nerves, any great derangement in the nervous function must necessarily modify, and in some degree effect, the corporeal frame of the infant. In what other way can we account for the malformations with which children are sometimes born? It is a well-known fact, that women who are subjected to little or no mental anxiety—women who live out of the vortex of fashionable life, have almost uniformly healthy and well-formed children. I am quite confident of the truth of what I state, that the *future good health of a child will, in a great measure, depend upon the state of the mother's mind.* Many continental physicians, and physiologists of great eminence, entertain the same opinion. M. Esquirol has had many opportunities of noticing how much the mind of the mother affects the future mental health and constitution of the offspring. For this reason he tells us, that it is often in the maternal womb that we are to look for the true cause, not only of imbecility, but also of the different kinds of mania. He observes, that during the French Revolution, many ladies then pregnant, and whose minds were kept constantly in a stretch by the anxiety and alarm inseparable from the epoch in which they lived, and whose nervous systems were thereby rendered irritable in the highest degree, were afterwards delivered of children whose brains and nervous systems had been similarly affected to such a degree by the state of the parent, that in future life, as children, they were subject to spasms, convulsions, and other nervous affections; and in youth, to madness, imbecility, or dementia, almost without any exciting cause. The extent to which the temporary state of the mother, during gestation, may influence the whole future life of the child, may be conceived from a single fact recorded by the same author. A pregnant woman, otherwise healthy, was greatly alarmed by the threats of her husband in a state of intoxication; she was afterwards delivered at the usual time of a delicate child. The child had, however, been so much affected by its mother's agitation, that up to the age of eighteen it continued subject to panic terrors, and then became completely maniacal.

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* Genesis xxx. 41.

The nervous timidity of James VI. is said to have been owing to the mind of his mother having been during her pregnancy in a state of great excitement. Dr Combe had under his care a young lady suffering from extreme nervous sensibility. This was partly attributable to prolonged excitement and alarm in her mother, who, when pregnant with her, spent several days half immersed in water during a storm at sea, and in the hourly expectation of shipwreck and death. The following judicious advice is to be found in the 'Memoirs of the Margravine of Anspach:'—"When a female is likely to become a mother, she ought to be doubly careful of her temper, and in particular to indulge in no ideas that are not cheerful, and no sentiments that are not kind. Such is the connexion between the mind and the body, that the features of the face are moulded commonly with an expression of the internal disposition; and is it not natural to think that the infant, before it is born, may be affected by the temper of its mother?"

The physician may learn a very important practical lesson from these facts. They demonstrate to him how careful he ought to be in pointing out to those entrusted to his professional care, the evil consequences likely to result from mental perturbation. How often do we witness nervous and irritable females, far advanced in gestation, exposed to great sources of mental agitation; and what is the result? In a majority of instances they give birth to weakly and unhealthy children. Every thing calculated to excite the nervous system ought to be most religiously avoided by females in a state of pregnancy: they should debar themselves, for a short time, from the mental excitement inseparable from midnight balls, theatrical representations, and morning concerts. To those unacquainted with the intimate connexion subsisting between the nervous and vascular systems, and to the influence of the mind on the health of the corporeal frame, it may appear visionary and ludicrous to lay down rules for the mental management of individuals so circumstanced. But the practical physician will think otherwise; he will, if he performs his duty, and if he has the interest of his patient and her offspring at heart, recommend her studiously to avoid anything likely to excite the mind and agitate the nervous system. The ancient physicians, who were more observant of nature than many of the faculty of the present day, bearing in mind this important principle, have recommended that women in a state of pregnancy should carefully avoid all causes which have a tendency to rouse the passions; that their minds should be kept calm and free from all excitements. Is this advice acted upon in the present day? How often has the physician the pain of witnessing the most delicate and nervous women exposed to scenes calculated to rouse, to the highest pitch of excitement, the nervous functions! Not many months ago a female, far advanced in pregnancy, was so excited by a theatrical representation which she was witnessing, that she was removed from the theatre in a state of labour, and the poor infant which she gave birth to was born dead. It is the imperative duty of the physician to point out to his patient the danger of thus trifling with the health of herself and offspring.

CHAPTER XII.

ON THE FIRST INDICATIONS, AND EARLY TREATMENT OF INSANITY.

It will be my object in this chapter to establish that there is a well marked stage in the progress of insanity, which may be called "premonitory," in which the experienced and intelligent physician may be able to detect the incipient dawnings of mental disease. In doing so it will be necessary to demonstrate the following points:—

1. The brain is the material organ of the mind.
2. Insanity is invariably the consequence of bodily disease.
3. On the application of the general principles of pathology to the diseases of the brain.
4. Insanity is not a specific affection.
5. On the importance of early treatment.
6. Causes of insanity, insidious and apparent.
7. On the early physical symptoms of insanity.
8. On the early mental symptoms of insanity.
9. Physical treatment of the incipient state.
10. Mental treatment.
11. On the influence of the will over the affections of the mind.

The consideration of the early symptoms of disordered mind has been much neglected by those whose province it was to fully investigate this important subject. This question has not been considered philosophically. For some time it was generally believed that in all cases of mental disease the mind itself was the exclusive seat of the affection; that organic derangement had nothing whatever to do with the malady; and he who hinted that the mental aberration was only a sign of some physical derangement going on in the brain, or some distant part of the body affecting sympathetically the material organ of mind, exposed himself to the charge of materialism, and was accused of promulgating doctrines subversive of and repugnant to the principles of Christianity. In every case of insanity, the mind abstracted from its physical organization—the mental principle itself, was supposed to be the seat of disorder. This was considered as the orthodox notion on the subject; the idea of mind being in the remotest degree dependent on material structure for its development was scouted as being in a high degree dangerous and unphilosophical. The natural consequence of this belief was, that medical men looked exclusively to the mental affection, irrespectively of its invariable antecedent, and accompaniment, the physical disorganization. Carrying out this view of the matter, medical men endeavoured to frame definitions of insanity, to embrace within one proposition all the varieties, shades, and distinctions which constitute intellectual disorder. Thus a standard of insanity was erected by which the sanity or insanity of every mind was to be tested.

The tests of insanity were, however, not uniform. Each medical man had his own peculiar standard or idea of what constituted derangement of mind, and no person was considered to be insane unless he came up to this preconceived notion. The natural result of this was, that medical men entirely overlooked the consideration of the early or incipient stage of insanity, for derangement was never admitted to be present until it had obtained a certain degree of development. In fact, insanity was not recognized until the affection assumed an undisguised and unmasked character. Even at the present time this mode of investigation is adopted by a few physicians who devote their attention peculiarly to this class of affections, and with the most unhappy results. It requires but little sagacity to pronounce an authoritative opinion with respect to the presence of insanity when the mental impairment is obvious and apparent to the most superficial observer; but the difficulty consists in detecting the early and delicate shades of insanity before the delusion becomes perfectly evident. It is now generally admitted by physiologists that the brain is the material organ through which the mind manifests its powers. This is an axiom which few medical men of the present day would have the courage to question. If this be allowed, then it will not be difficult to establish that in every case of disordered mind the brain is the seat of the disease, and that the derangement of the mental function is but an effect or consequence of a physical lesion of the cerebral organ. An overwhelming mass of evidence demonstrates, with almost mathematical accuracy, that the integrity of mental phenomena is dependent upon a healthy action of the great centre of the nervous system, the brain. No rational views of the character of deranged mind can be entertained until this almost first principle is admitted. We have no idea of mind unassociated with matter. In a ratio to the development of brain do the mental faculties exhibit power and vigour of action. The slightest derangement of the cerebral mass produces an effect upon the manifestation of mind. In some cases of disease of the brain, and nervous system generally, after the patient has apparently recovered from the acute symptoms of the attack, the mind appears to have obliterated from its recollection every impression which had previously been made upon it. There are numerous illustrations of this fact on record. The following instances will be found interesting to the reader.

The Rev. William Tennant, of Freehold, in the state of New Jersey, America, being in a bad state of health at the time, was one morning conversing with his brother in Latin, when he fainted, and apparently died. After the usual time he was laid out, and the family and friends were invited to attend the funeral. His physician, returning from the country in the evening, examined the body previous to interment. He was not satisfied that vitality was suspended. Upon being informed that one of the persons who had assisted in laying the body out, thought he had perceived a little tremor of the flesh under the arm, he endeavoured to ascertain the fact, and being convinced that life was not yet extinct, he insisted that those who had been invited to the funeral should be requested not to attend.

Mr Tennant continued in this state of suspended animation for three days. On the third day the family and friends again assembled to the funeral, when Mr Tennant manifested evident signs of life, opened his eyes, and gave a heavy groan. He was gradually restored; but it was long before he regained good health. A considerable time after his resuscitation, and when able to take notice of what passed around him, he observed his sister one day reading, and asked her what she had in her hands. She answered that she was reading the Bible. He replied, "What is the Bible? I know not what you mean." She reported this to his brother, and Mr T. was found, upon examination, to be totally ignorant of every transaction of his past life. He could not read a word, nor did he seem to have any idea what it meant. As soon as he became capable of attention, he was taught to read and write, as children usually are taught, and afterwards began to learn the Latin language under the tuition of his brother. One day as he was reciting a lesson in *Cornelius Nepos*, he suddenly started, clapped his hand to his head, as if something had hurt him, and made a pause. His brother asked him what was the matter. He said that he felt a sudden shock in his head, and it now seemed to him as if he had read that book before. By degrees his recollection was restored, and he could speak the Latin as fluently as before his sickness. His memory so completely revived, that he regained a perfect knowledge of the past transactions of his life.*

A very singular case of the obliteration of the deepest impressions occurred in Oxford somewhat later than the middle of last century. A woman who was there executed was restored to animation. She completely recovered her health—married, had children, and conducted herself respectably through life. But the effect produced on her memory by the shock which her bodily frame had sustained was most extraordinary. She recollected every thing distinctly up to the day of her trial; but from that day she recollected nothing; and the period between her trial and execution for ever after remained a blank in her memory. She had behaved in prison with great composure and resignation—had partaken of the Sacrament on the morning of execution—sung a hymn on the scaffold—taken a calm farewell of her friends—and betrayed no symptoms of terror. But all these scenes were for ever effaced from her mind; nor had she ever afterwards the faintest glimmer of recollection that she had been placed in such jeopardy. Her memory with regard to every thing else was unimpaired. It would seem as if the ideas that possessed her mind during her imprisonment, and were uppermost on it, had literally been all wiped away.

Dr Abercrombie refers to many instances of the same character. Mr Abernethy cites the case of a man who was born in France, but had spent the greater part of his life in England. For many years he had lost the habit of speaking the French language. He received a blow on the head, and during the time he was suffering from the effects of this injury, he always conversed in French. A man was admitted into St Thomas's Hospital, in a state of unconsciousness, owing to an injury of the head. When he had partially recovered, he spoke a language which no one could understand. It was, however, discovered to be Welsh. It appeared that thirty years previously he had left Wales, but had entirely forgotten his native language. When this man had perfectly recovered, he again forgot the

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* This interesting narrative is written by a brother of Mr Tennant, and was published in the 'Assembly Missionary Magazine.'

Welsh language, and spoke English with fluency. A Lutheran clergyman informed Dr Rush, the American physician, that the Germans and Swedes, of whom he had a considerable number in his congregation, when near death, always prayed in their native language, though some of them, he was confident, had not spoken these languages for fifty or sixty years.

In these cases we witness the marked effects produced upon the condition of the mind by physical derangement of the material organization. In some cases of insanity the occurrence of corporeal disease has been known to entirely suspend the mental affection. In a previous portion of this work I have referred to the fact of the mind of the insane being occasionally restored to health a short period prior to death. The following case related by Mr Tuke, is illustrative of the vicarious manner in which diseases of the body and of the mind oftentimes succeed to and take the places of each other. "A young woman, who was employed as a domestic servant by the father of the relater, when he was a boy, became insane, and at length sank into a state of perfect idiocy. In this condition she remained for many years, when she was attacked by a typhus fever, and my friend, having then practised for some time, attended her. He was surprised to observe, as the fever advanced, a development of the mental powers. *During that period of the fever when others are delirious, this patient was entirely rational.* She recognized in the face of her medical attendant the son of her old master, whom she had known so many years before; and she related many circumstances respecting his family, and others which had happened to her in her early days. But, alas! it was only the gleam of reason; as the fever abated, clouds again enveloped her mind. She sank into her former deplorable state, and remained in it till her death, which happened a few years afterwards."

I refer to these facts with the view of conclusively establishing what I conceive to be the most important elementary principle connected with this subject; *viz.*, that in every case of insanity—that in every deviation from a healthy condition of the mind, the brain is the seat of the affection. The idea of the mind being disordered independently of physical disease, has no existence except in the imagination of those who wilfully close their understandings to the reception of the truth. It does not require much medical knowledge or penetration to perceive the absurdity of the notion of a *purely functional derangement of the mind.* How can the immaterial essence be the exclusive seat of the absurd delusions and fancies under which lunatics often labour? There is no such thing as purely functional disorder of any organ without a physical alteration having preceded or accompanied it. Unless we entertain correct notions on this subject, no rational idea can be formed of the principles which ought to guide us in the treatment of insanity.

"I consider," says Sir Henry Halford, "insanity to be connected with bodily indisposition, throughout its whole course, though this be less apparent in some cases than in others. It is obvious in the instances of females who become deranged after lying-in; this is, perhaps, the most remediable specimen of the disease: it is obvious also in that modification of the malady which we see in females of a particular temperament, at a certain period of life, when they sometimes become melancholy; and it is striking in the case of sailors, after a great sea-fight, where there had been previously great earnestness, much personal exertion, protracted watchfulness, and, after the conflict, an improvident indulgence in spirituous liquors. These combined causes produce great irritation of the brain, and derangement; but such patients generally get well. I remember to have seen at least twenty patients in a state of derangement, in one house of reception of lunatics, after Lord Howe's victory on the 1st of June."

Having satisfactorily proved, that in every case of insanity the brain is the seat of the disease, the next question to consider is, whether the general principles of pathology which are had recourse to, with the view of elucidating the diseases of other organs, are not applicable to the brain and its disordered manifestations? It is fallacious to suppose insanity to be a *specific* affection invariably exhibiting the same identical characteristics; like other organic diseases, it assumes many aspects, and has also an early as well as an advanced stage. The eye, the lungs, the stomach, the heart and liver, are subject to a number of affections, in all of which the peculiar function which each organ is destined to perform is obviously disordered. In every disease of the eye the vision is more or less obstructed; in every disease of the lungs the respiration is interfered with. The lungs may be inflamed, may be ulcerated, be hepatized, or effusion may take place within its substance; and in all these dissimilar disorders the breathing is manifestly deranged. How impossible would it be for us to embody within one definition all the symptoms which result from so great a variety of pulmonary diseases? The brain, like the lungs, liver, and heart, is subject to a multiplicity of affections, in all of which the mental faculties are more or less affected; and yet, in investigating the phenomena of its diseases, we are influenced by principles totally at variance with those which direct us in the study and treatment of other organic maladies.

We must consider this subject *medically*, not legally. For the ends of justice it may not be prudent to admit the existence of insanity until the mental alienation attained a certain and well-defined amount of development; but if we are to investigate the disease as medical men, and treat it according to the recognized principles of therapeutics, we must view the mind as disordered in its very earliest and incipient stage. In the diseases of the liver, heart, and lungs, how important it is for us to detect the first indications of a departure from health; for we know that in that stage our remedial agents may be exhibited with much greater advantage than at any other period of the disease. The slightest alteration in the breathing, the first appearance of a cough and pain in the chest, attract our observation; and if upon examination we find that the symptoms indicate the presence of the early or incipient stage of pneumonic inflammation, we immediately have recourse to those remedies which experience tells us are beneficial in subduing inflammation of the lungs. In affections of this organ we do not, as we do in the diseases of the brain, disordering the manifestations of mind, refuse to admit the existence of an organic malady, until it is fully developed; but we, immediately upon the first signs of disordered action, subject the patient to medical treatment, and thus prevent serious and perhaps iremediable organic mischief from ensuing. The first symptoms of insanity are indications of disease going on in the brain; they are signs of physical mischief; and if the patient be neglected at this period of the attack, incurable mental derangement may result.

Of the importance of having recourse to early treatment in cases of insanity, few will entertain a doubt. Dr Finch has succeeded in restoring the mind to health in the proportion of 61 to 69 of the patients who were admitted into the asylum within *three months* of the attack. At the "Retreat" at York, 7 out of 8 recent cases are cured.

On this part of the subject the reader will find some interesting particulars in pages 97 and 98 of this work. Dr Burrows, in alluding to the necessity of paying early attention to the first dawnings of mental disorder, has made the following just and forcible observations:—

"Did mental derangement experience the same prompt attention as most other complaints, it is impossible to judge how much more favourable the results might prove: the reverse almost always obtains; and therefore insanity more frequently degenerates into a chronic and continuous type before remedies are applied. All practitioners have remarked how difficult it is of cure when it has taken the latter form, comparatively with acute or recent cases. In this disposition, it but assimilates to other diseases. For be the disease what it may, whenever remedies are neglected after its first access, there is great danger of its assuming an obstinate, if not a permanent, character; unfortunately, the approach of insanity, though generally perceptible to strangers, is rarely remarked by relations. We are all apt to shun that which is painful or displeasing: so the insidious approaches of mental derangement are rather construed into nervous irritability, or eccentricity, or anything rather than the truth; and are suffered to proceed till some terrible exacerbation of delirious fury or despondency ensues. A malady is thus often confirmed in one whom we most value, and whose intellects, very probably, might have been preserved, had timely aid been administered. How frequently do we witness the bitterness of self accusation, and the unceasing regrets of the near connexions of lunatics, because they have persevered in their wilful blindness till the calamity they deprecated has occurred! Assuredly, the approach of intellectual disorders sometimes escapes the most intelligent observer; while bodily ailments, from the derangement of some ordinary function, or from acknowledged pain, are at once visible. Consequently, the remedy in the one case is unsought, which, in the other, is immediately applied. Thus the chance of cure in mental and corporeal complaints are, in a variety of ways, rendered unequal. Even under these and many other disadvantages, incontrovertible proofs have been adduced of how great a proportion recover. And were it not that where evidence militates against preconceived notions it is always pertinaciously rejected, we might have been convinced, years ago, that insanity was cured in a ratio equivalent probably to what is experienced in most disorders. Thus, a celebrated physician was discredited when he stated, that *nine* out of *ten* cases of insanity would recover if medically treated *within three months from the attack.*[*] Doubts of his veracity were implied; but we now see, that, in situations perhaps less promising, eight in ten, or even six in seven *recent* cases, are credibly reported to have actually recovered.[†]

"Although in many cases the attack of insanity is slow, insidious, and often imperceptible in its progress, yet there are many instances where the disease manifests itself suddenly without exhibiting any apparent premonitory signs. In these cases, however, I believe there must have existed an hereditary predisposition; there was, no doubt, a peculiar formation of brain rendering it susceptible of diseased action. Violent exercise of the passions also often induce the sudden development of insanity. The following is a case in point.

Garrick was acquainted with a worthy man who lived in Leman Street, Goodman's Fields; this friend had an only daughter, about two years old; one day as he stood at his dining-room window, fondling the child, and dangling it in his arms, it fell into a flagged area. The poor father remained at his window screaming in wild agonies of grief. The neighbours flocked to the house, took up the child and delivered it dead to the unhappy father, who wept bitterly and filled the street with lamentations. He instantly became insane, and from that moment never recovered his understanding. As he had a sufficient fortune, his friends chose to let him remain in his house, under two keepers appointed by Dr Monro. Garrick frequently went to see his distracted friend, who passed the remainder of his life in going to the window, and there playing in fancy with his child. After some dalliance, he dropped it, and bursting into a flood of tears, filled the house with shrieks of grief and bitter anguish. He then sat down in a pensive mood, his eyes fixed on one object, at times looking slowly round him, as if to implore compassion.*

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[*] Pinel.

[†] Parliamentary Report, 1789.

Some years back there used to be pointed out in the streets of Glasgow, a man whose mind had become unsettled by a very strange circumstance.—When a youth he had happened to pass a lady in a crowded thoroughfare—a lady whose extreme beauty, though dimmed by the intervention of a veil, and seen but for a moment, made an indelible impression on his mind. This lovely vision shot rapidly past him, and was in an instant lost in the common-place crowd through which it moved. He was so confounded by the tumult of his feelings that he could not pursue or even attempt to see it again. Yet he never afterwards forgot it. With a mind full of distracting thoughts, and a heart filled alternately with gushes of pleasure and pain, the man slowly left the spot where he had remained for some minutes, as it were, thunder-struck. He soon after, without being aware of what he wished, or what he was doing, found himself again at the place. He came to the very spot where he had stood when the lady passed, mused for some time about it, went to a little distance, and then came up as he had come when he met the exquisite object of his reverie—unconsciously deluding himself with the idea that this might recal her to the spot. She came not—he felt disappointed; he tried again—still she refrained from passing. He continued to traverse the place till the evening, when the street became deserted. By-and-by he was left altogether alone. He then saw that all his fond efforts were vain, and he left the silent, lonely street at midnight, with a soul as desolate as that gloomy terrace. For weeks afterwards he was never off the streets. He wandered hither and thither throughout the town like a forlorn ghost. He often visited the place where he had first seen the object of his abstracted thoughts, considering, that he had a better chance of seeing her there than anywhere else. He frequented every place of public amusement to which he could purchase admission; and he made a tour of all the churches of the town. All, alas! was in vain. He never again placed his eyes upon that angelic countenance. The course of his mind was stopped at a particular point. After this he made no further progress in any intellectual attainment. He acquired no new ideas.—His soul stood still. He was like a clock stopped at a particular hour. He ever after wore a peculiarly long-backed and high-necked coat, being the fashion of the year in which he beheld the lady. When this unfortunate person was last seen, he was getting old, and seemed still more deranged than formerly. Every female whom he met in the street, especially if at all good-looking, he gazed at with an inquiring, anxious expression, and when she had passed, he usually stood still a few minutes and mused, with his eyes cast upon the ground. It was remarkable that he gazed most anxiously upon women whose age and figure most nearly resembled that of his unknown mistress at the time he had seen her. He did not appear to make allowance for the years which had passed since his eyes met that vision. This was part of his madness. Strange power of love! Incomprehensible mechanism of the human heart!

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* Garrick was often present at this scene of misery, and was ever after heard to say, that it gave him his first idea of King Lear's madness. When in company he would often give a representation of this unfortunate father. He leaned on the back of a chair, seeming with parental fondness to play with a child, and, after expressing the most heartfelt delight, he suddenly dropped the infant, and instantly broke out in a most violent agony of grief, so tender, so affecting, and pathetic, that every eye in the company was moistened with a gush of tears. "Thus it was," said Garrick, "that *I learned to imitate madness;* I copied nature, and to that I owed my success in King Lear."—*Murphy's Life of Garrick.*

A gentleman related to me the particulars of the following case of suddenly developed insanity which happened to his own son. The young gentleman to whose case I refer had manifested from early life a powerful intellectual capacity. He was sent to college, where he distinguished himself by taking a very honourable degree. He was universally considered not only an accomplished scholar, but to possess attainments of a high order. He had up to a certain period exhibited no symptoms of mental aberration. One Sunday evening he was driving in his cabriolet past Clerkenwell Church during divine service. The congregation were engaged in singing a hymn. The gentleman stopped his cab, gave the reins to the servant, got out, and marched into the middle aisle of the church, where he proclaimed himself to be Jesus Christ. This was the first evidence of insanity which he exhibited. "Why he should have proclaimed himself to be Jesus Christ I cannot tell," said the father to me, "for he had not the remotest belief in the existence of a Supreme Being." From that moment, although previously in apparent mental health, he became unequivocally mad.

In many of these cases, however, which appear to be sudden, if the condition of the patient's mind was inquired into, it would be found that the disease of the brain has been evident for some period prior to the full development of the affection. On this point I cannot refer to a higher authority than that of the late Dr Armstrong, who makes the following just observations on this subject:—

"Almost all affections of the head," says Dr Armstrong, "*though they appear to be sudden, will be found, on examination, to be very slow,* ESPECIALLY MADNESS. If the case, whether it occur in a congestive or in an excitive form, be traced backward, you will find evidence of the patient having, in the one case, been in a most depressed state of mind, and in the other, of his having been in a most active state of mind; and in both cases it will appear that the stomach, liver, bowels, head, and skin were affected. This is important to remember in a preventive point of view. Examples of this kind have occurred in public characters. We have lost a Romilly, a Whitbread, and a Castlereagh; and the history of these distinguished men shows that their corporeal functions were disordered before their madness came on. Some persons have requested to be bled on account of the great depression which they have felt previous to an attack of insanity. I knew an individual who repeatedly requested his medical man to bleed him under these circumstances. His request was refused; and the consequence was, that he made an attempt—and that an effectual one—upon his life."

Connected with this interesting subject it is important to ascertain what are the particular mental feelings experienced by an individual whilst labouring under an attack of this malady. In many cases it is wisely ordained by Providence that the mind should not have the slightest consciousness of its melancholy condition. But there are cases in which at times the patient is perfectly aware of his insanity, and struggles against the delusions which are setting, like an incubus, upon the imagination. In a number of instances, the mind, from the first attack until final recovery, remains an entire blank. A gentleman who had for some time laboured under insanity, suddenly recovered. He appeared as if he had been walking in his sleep; he fancied that he had been in a long and troublesome dream; but had no idea that he had continued longer in it than one night. He expressed the greatest astonishment when told that he had been in that state for a period of three years.

There is a great analogy between the state of mind in insanity and in dreaming. In both cases the individual loses all control over the train of thought. The laws of healthy association are entirely suspended; one idea suggests another, without there being any necessary connexion between them—

> " Each stamps its image as the other flies :
> Awake but one, and lo! what myriads rise."

The fanciful creations, as in dreaming, have all the evidence of reality impressed upon them. Occasionally the individual, during dreaming and an attack of insanity, feeling conscious that his mind is not in its natural condition, endeavours to regulate the train of mental impressions, and ask himself, " Is this a dream?" or, " Is this insanity?" Milton's description of a troubled dream is considered to be an accurate delineation of the workings of the insane mind.

> ———" But know that in the soul
> Are many lesser faculties that serve
> Reason as chief; among these, Fancy next
> Her office holds ; of all external things,
> Which the fine watchful senses represent,
> The forms, imaginations, airy shapes,
> Which reason joining or disjoining, frames
> All we affirm or what deny, and call,
> Our knowledge or opinion ; then retires
> Into her private cell, when nature rests.
> Oft in her obscure mimic Fancy wakes
> To imitate her; but misjoining shapes,
> Wild work produces oft, and most in dreams,
> Till matching words and deeds long past or late."

Insane patients recollect, as Dr Haslam justly observes, ideas which were transmitted through the senses, better than the combinations of their own mind. It should never be forgotten that the insane appear never to forget any coercion or kindness manifested towards them during an attack. The late celebrated Robert Hall, of Cambridge, was unhappily afflicted with this painful malady. He was sent to an asylum, where he represents himself to have been subjected to very harsh and cruel treatment. After his recovery, in the course of a conversation with a friend, he referred, with feelings of indignation, to the coercive measures pursued during his temporary incarceration. I refer to this fact to prove that the patient's mind is conscious of the impressions made upon it under these circumstances. He says, " Sir, they took away my watch, and confined me in a place which overlooked the ward, in which there were a number of pauper lunatics, practising all manner of ludicrous antics. Sir, this sight was enough to make me ten times worse; they were as mad as March hares; I was at times quite insensible. I don't believe Dr —— was aware how I was treated by a lazy keeper; do you know, Sir, to save himself a little time and trouble, the fellow came at 5 o'clock and fastened me down to my bed, where I could not stir either hand or foot until about 8 o'clock in the morning. During this time I had many lucid intervals; he had no business to leave me so long, but it was to enable him to go away sooner. You cannot conceive the horrors of my situation, when I found myself sensible. I hope, if ever I am taken ill again, you will use all your influence to prevent my being sent there a second time. It is a very mistaken notion that severity is requisite. *Mild* *treatment, with proper restraint and kindness,* is all that is necessary in such cases. There is nothing so beneficial as private confinement, with proper medical attendance, to prevent abuses by unfeeling keepers."

In many cases of insanity, the reason is scarcely ever so entirely overthrown as not to leave, at times, traces of former impressions. Dean Swift was an instance of this: having been of sanguine disposition, and depending much on the consolations of friendship, his mind seemed to sink under the complicated pressure of disappointments in life, and the loss of his dearest friends. It was his usual custom, for a long time after his confinement, to address every stranger he saw with these words: "Did you know Dr Sheridan? I lost my right arm when I lost him."

The most curious point connected with the philosophy of insanity, is the sudden revival of impressions made upon the mind previously to the attack, and which impressions have been entirely suspended during the existence of the illusion or hallucination. In illustration of this singular phenomenon, Dr Prichard quotes a case from the "*American Journal of Science.*"—"A man had been employed for a day or two with a beetle and wedges in splitting pieces of wood for erecting a fence. At night, before going home, he put the beetle and wedges into the hollow of an old tree, and directed his sons, who had been at work in an adjoining field, to accompany him next morning to assist him in making the fence. In the night he became maniacal, and continued in a state of insanity for several years, during which time his mind was not occupied with any of the subjects with which he had been conversant when in health. After several years his reason returned suddenly, and the first question he asked was, whether his sons had brought home the beetle and wedges? They, being afraid of entering upon any explanation, only said, that they could not find them; on which he rose from his bed, went to the field where he had been at work so many years before, and found, where he had left them, the wedges, and the iron rings of the beetle, the wooden part being entirely mouldered away."

In many cases, however, the patient has a clear recollection of all that takes place during the attack. Mr Percival, who was for some time confined in various asylums, has published an account of every minute circumstance that transpired with reference to himself, from the first commencement of his mental disorder until he obtained his liberty. In a number of instances the mind of the patient is engaged in a constant struggle to subdue its erroneous conceptions. He feels that his mind is not in a healthy condition; he is conscious that his mental impressions are false, and an effort is made to conquer them. It is a fallacy to suppose that a person cannot be insane without being unconscious of his melancholy state; or that it is a moral impossibility for a madman to control for a time the morbid train of thought. I am not now referring to what are termed lucid intervals; but I maintain that the erroneously received notions respecting the irresponsibility of lunatics are founded upon a misconception of the character of insanity. I believe there are many lunatics who ought to be held amenable for their actions, because they are not deprived of the power of controlling their ideas. When Martin set fire to York Minster, a conversation took place among the inmates of a neighbouring madhouse relating to the circumstance. The question discussed was, whether Martin would suffer the extreme penalty of the law for the crime. Various were the opinions expressed. In the midst of the conversation, one patient, apparently as mad as the rest, exclaimed, "He (Martin) will not be hanged—of course he will escape."—"For what reason?" asked several voices.—"They cannot hang him," replied the lunatic, "because he is mad—*he is one of ourselves!*" Here was a man unequivocally insane, and yet fully capable of exercising a correct process of reasoning. Would it be right to treat such a person as an irresponsible agent? Let me not be mistaken—I believe that a large mass of those afflicted with this most terrible calamity, are not competent to control their actions, and it would be the height of cruelty to consider them able to do so; but there are cases of persons unquestionably of unsound mind, who ought to be held amenable for their conduct, and punished accordingly. This is not, however, the place to enter fully into a consideration of this important subject.

With regard to the general and particular causes of insanity, it is not my intention to say much. In all cases the morbid affection has its seat in the brain. That organ may be directly affected and insanity supervene, as in cases where the mind becomes unhinged in consequence of blows inflicted upon the head, or when it is violently agitated by intense mental emotion. The brain is often sympathetically influenced, the irritation being situated at some distance from the sensorium. Chronic disease of the stomach—long continued indigestion, will occasionally affect the brain and disorder its functions. The physical lesions in organs remote from the brain, and which derange the operations of the mind, are not investigated in a manner commensurate with their great importance. In all cases of insanity, whether in the incipient or advanced stage, the condition of the liver, stomach, &c. ought to be carefully inquired into, for in these organs are often found the cause of the irritation.

Among the incentives to insanity, moral causes stand prominently conspicuous. Where we find one case of mental derangement arising from physical disease, we have six the consequence of mental perturbation. The statistical records of all our established lunatic asylums clearly establish this fact. It is important to bear in mind, that long continued indulgence in excitement of mind, particularly if there be an hereditary predisposition to cerebral disease, will ultimately give rise to insanity.

When the mind dwells for any length of time on any one particular idea, it is very apt to assume an undue importance in the estimation of the individual, and thus give rise to monomania. Don Quixote's insanity was of this description. A disposition to view with an exaggerated idea of its value any impression which may be made upon the mind, ought sedulously to be guarded against.

The habit of what in common parlance is termed "building castles in the air," has a most pernicious influence upon the health of the mind. There is a legitimate exercise of the imaginative faculty which is advantageous to the understanding, and to this no reasonable objection can be urged; but when the fancy is allowed "to body forth the forms of things unknown," without being under proper discipline, much evil will result. Individuals endowed with an unhealthy expansion of the imagination, create a world within themselves, in which the mind revels until all consciousness of the reality which surrounds them is lost. The disposition to *reverie* is very pernicious to intellectual health. Many habituate themselves to dream with their eyes open, without the senses being literally shut; they appear to be insensible to the impressions of objects external to themselves. This condition of mind borders closely upon the confines of insanity. If the imagination be thus permitted to obtain so predominant an influence over the other faculties of the mind, some particular notion will fix itself upon the fancy; "all other intellectual gratifications will be rejected; the mind, in weariness or leisure, recurs constantly to the favourite conceptions, and feasts on the luscious falsehood whenever she is offended by the bitterness of the truth. By degrees the reign of fancy is confirmed; she grows first imperious, and in time despotic: then fictions begin to operate as realities, false opinions fasten upon the mind, and life passes in dreams of rapture or anguish." *

"I have sometimes," says Contarini Flemming, "half believed, although the suspicion is mortifying, that there is only a step between his state who deeply indulges in imaginative meditation, and insanity; for I well remember, at the period of my life when I indulged in meditation to an extreme degree, that my senses appeared sometimes to be wandering. I cannot describe the peculiar feeling I then experienced; for I have failed in so doing to several eminent surgeons and men of science, with whom I have conversed respecting it, and who were curious to become acquainted with its nature. But I think it was, that I was not always assured of my identity or even existence; for I found it necessary to shout aloud to be sure that I lived; and I was in the habit very often, at night, of taking down a volume, and looking into it for my name, to be convinced that I had not been dreaming of myself. At these times there was an incredible acuteness or intenseness in my sensations. Every object seemed animated, and, as it were, acting upon me. The only way that I can devise, to express my general feeling, is, that I seemed to be sensible of the rapid whirl of the globe."

A medical gentleman, who exhibited manifest signs of derangement, informed Dr Beddoes, that his ill success in his profession filled him with anxiety for himself and family. He was in the habit of sitting for hours ruminating; and when he found, day after day, no summons arrive, he would saunter abroad and indulge in a reverie of wishes. These wishes he would sometimes arrange into a climax of events, worthy of the glassman of the Spectator; at length he would direct his footsteps homewards, under a kind of apprehension that some person of consequence had actually sent for him during his absence. This state of mind is as near insanity as sanity.

Having alluded thus briefly to the causes of insanity, I come next to consider the early indications, physical and mental, of disease of the brain. The physical symptoms, viewed independently of the disorder of the mind itself, are seldom sufficient to convey to us an accurate conception of the presence of the malady. In many cases it is difficult to discover which class of symptoms is to be considered in the relation of cause, and which as effect. In a multiplicity of instances there is no appreciable sign, after death, of physical derangement. Such is the fact in the majority of the cases of insanity which come under the observation of the medical practitioner. In every case of suspected insanity, or where the hereditary predisposition is strongly manifested, the condition of the physical organs should be carefully inquired into. We all know how great a sympathy exists between the liver, stomach, and the brain: whenever the liver is disordered, the mind, more or less, is sure to be implicated in the affection: the same fact holds good with regard to the stomach. In "*The Anatomy of Suicide*" I have considered, at some length, the relationship between physical derangement of the liver, stomach, and intestines, and disorder of the mind; and to that work I refer the reader for information on these points. I cannot, however, leave this subject without adverting to the connexion between mental disease and affections of the heart—a point of considerable importance in the study of maniacal maladies. In many cases of disease of the heart, the most prominent symptom is delirium. It has been supposed that some of the cases of insanity, arising from perverted passions, disappointed affections, loss of friends, sudden diminution of worldly possession, or the spectacle of some unusual or appalling crime, may be intimately connected with the influence of such impressions on the circulation. On this subject Dr Seymour observes, "that it is notorious that, during the terrible scenes of the French Revolution, organic diseases of the heart, as well as cases of aberration of mind, were wonderfully increased; and it is far from improbable that the diseases of the heart, brought on by long watching, frequent peril, and urgent anxiety, were productive, in their turn, of such an influence on the circulation in the brain, as to alter its powers of perception. In advanced life, there is no doubt that the influence of the diseased structure of the heart is the principal cause of the most frequent and most fatal of the diseases of the brain."* Before attempting to describe what I consider to be the incipient mental symptoms of insanity, I would premise that it is important to recollect that a distinction must be drawn between the natural character of the individual and those manifestations of mind which are the result of a morbid action going on in some part of the brain. It will be impossible for us to pronounce a sound opinion as to the presence of insanity in any given instance, until we have made ourselves thoroughly conversant with the healthy characteristics of the mind upon which we are to sit in judgment. What may be a natural mental endowment in one person, would be in another an unequivocal indication of derangement of mind. A man may have exhibited eccentric habits in early life—he may have always been disposed to depart from the ordinary and recognized conventionalities of society, and yet we should not be justified in considering such a person to be insane. Eccentricity and insanity, although often closely approximating each other's confines, are yet essentially distinct in their nature. It is, however, often extremely difficult to say where eccentricity ends and insanity commences. No certain rules can be laid down for the direction of the medical man on this point—much must be left to his own judgment; and it will not be until he has taken all the circumstances of the case into consideration, and thoroughly investigated the past and present condition of the patient, that he will be able to arrive at any thing like a satisfactory conclusion. "Between the erroneous opinions of the insane, and the singular opinions of the eccentric, there is," says an able authority, "the same difference as there is between the permanent readiness of argument, imagery, and language, which is the result of study and practice, and those sudden and temporary gusts of eloquence produced by a bottle of wine."†

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* Johnson's 'Rasselas.'

The experienced and practised eye of the physician will not often confound healthy singularity and eccentricity with the delusions of insanity. In studying the nature of this singular disease, we should be aware that insanity in many cases is often nothing more than an exaggeration of the natural character of the individual. Pinel has noticed this fact. He says, "Men of robust constitution, of mature years, with black hair, and susceptible of strong and violent passions, appear to retain the same character when visited by this most distressing of human misfortunes. Their ordinary energy is augmented to outrageous fury. Violence, on the other hand, is seldom characteristic of the paroxysm of individuals of more moderate passions, with brown or auburn hair. Nothing is more common than to see men with light coloured hair sink into soothing and pleasurable reveries; while it is seldom or ever that they become furious or unmanageable." An individual with conscientiousness naturally strongly developed, will, if insane, exhibit delusions connected with this mental feature. Such persons are liable to hallucinations relating to religion. They are apt to feel great remorse and contrition for imaginary sins committed against an offended Deity. The man who is disposed to form exaggerated notions of his own mental endowments, will assume, when under the influence of the disease, great self complacency, arrogance and pride. Such persons imagine themselves to be princes, emperors, kings, queens, and even the Supreme Being. A person naturally reserved and cautious will, when insane, be unusually depressed, melancholy, timid, and apprehensive. A patient who when in health exhibits a suspicious disposition, an inclination to suspect the sincerity of those around him, will manifest this mental feature in an exaggerated degree, when affected by maniacal excitement. If any one faculty of the mind is manifested with more than its ordinary activity, it must of necessity be exposed to derangement when subjected to the influence of those causes which so commonly call into existence this affection. Such an unnatural, and it may be termed unhealthy, development of brain and mind, strongly predisposes the person to mental disease; circumstances which would not have the slightest apparent effect upon some, are apt to unsettle the understandings of others. When we speak of a person being hereditarily predisposed to insanity, what idea do we wish to convey?—not that a particular quality of mind is transmitted from the parent to its offspring; but that the person has, in consequence of being born of parents subject to insanity, a peculiar *conformation of brain* liable to take on a certain action when exposed to the operation of those exciting causes, generally known to give rise to mental derangement. If this physiological principle be kept in view, it will not be difficult for us to understand why extra development of brain and mind should predispose that faculty to disorder.

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* Dr Seymour.

† Dr Gooch.

If a person be predisposed to consumption (and such cases are common), the predisposition consists in the individual having an unhealthy physical organization of lung, which renders the person susceptible to the influence of those agents which are known to develop diseases of the pulmonary organ. Such is also the fact with regard to the brain and its diseases. In one case the respiration is influenced by the disease of the lung, and in the other the affections of the mind are deranged, in consequence of the physical medium or brain being the seat of the malady.

With reference to prophylactic or preventive treatment, how important it is to keep in mind the principle here laid down. On this subject I shall have more to say presently. I now approach the most difficult part of this question, *viz.* the early mental symptoms of derangement of mind. In the first place it is important to know that, for some period before the mental delusion becomes apparent to others, the patient himself is conscious of the approach of the afflicting malady, and often struggles against the notions and impressions which are forcing themselves upon the mind. It is at this period, when the patient is combatting between conscious infirmity of mind and actual insanity, that the physician is able, with marked utility, to administer relief. If this be allowed to pass away, and the patient sinks into a state of apathy, the prospects of recovery will be considerably diminished. Few, however, at this early period will confess themselves to be labouring under the premonitory stage of insanity. If any suspicions are surmised, the idea is indignantly repudiated. This truth is beautifully illustrated by Shakspeare, in his account of the reasoning of Constance, when accused of being mad:—

"PANDULPHO.—Lady, you utter madness, not sorrow.
CONSTANCE.—Thou art not holy to belie me so;
I am not mad;—this hair I tear is mine;
My name is Constance; I was Geoffrey's wife;
Young Arthur is my son, and he is lost;
I am not mad;—I would to Heaven I were!
For then 'tis like I should forget myself:
Oh, if I could, what grief should I forget!—
Preach some philosophy, to make me mad,
And thou shalt be canonized Cardinal;
For, being not mad, but sensible of grief,
My reasonable part produces reason,
How I may be delivered of these woes,
And teaches me to kill and hang myself:
If I were mad I should forget my son;
Or madly think, a babe of clouts were he:
I am not mad; too well; too well I feel
The different plagues of each calamity."

The result of my observations on this point has clearly satisfied my mind, that, in the majority of cases, the patient is conscious of the existence of incipient mental derangement, and endeavours to reason himself out of his erroneous notions. He feels an unaccountable depression of spirits—strange impressions take possession of the mind—his feelings become changed—he is beset with strange fancies—manifests a disposition to avoid his former associates. During this period the patient often manfully fights against these delusions, and by so doing he may succeed in overpowering them. Even in cases of confirmed insanity, the patient is sometimes perfectly aware of his melancholy state, and expresses a resolute determination to master his mental delusions. The late Dr Uwins saw a patient in the act of dying, the constant burden of whose song was, "I have got a mopsey-popsey head—there is something in it, which, could I but extract, I should be well;" and, to the last, he made attempts to obtain an instrument for that purpose.

In cases of insanity, accompanied with a disposition to destroy, this feature is exhibited in a remarkable degree. How often have patients been known to struggle for weeks, and even for months, against the suicidal impulse!

There are cases of temporary insanity occurring daily, which are easily curable by the adoption of a proper system of physical and moral treatment. "Pending the bills, framed by two noted statesmen, for placing a gag on the mouth of the English nation, I was desired," says Dr Beddoes, "to see a gentleman, whose discourse alarmed his family. He had been out in his carriage; a momentary qualm had come over him. On returning home, he spoke of having seen persons known to be at a distance; and mentioned occurrences as the news of the day, none of which could have happened. He appeared to read the paragraph out of the *Star*, announcing the appointment of the Duke of Bedford to the Treasury, and of Mr Fox to a Secretaryship of State. He glanced over the debates; and, when he came to the division at the end, pointed with his finger to the ministerial numbers as a small minority, though, as is well known, exactly the reverse was the case. But this was not a common blunder. He did not mistake one side for the other; but it was on both sides a substitution of numbers, quite different from those stated in the newspapers, upon which, nevertheless, his eyes were intensely fixed. The patient, it should be observed, was a quiet character and a calm politician. He had no fever, pain, or other ailment; he ate and drank precisely as before; and his insanity disappeared in a couple of days, without ever returning."

There is a striking analogy between the commencement and progress of insanity, and the early and more advanced stage of intoxication. In fact the physician, when summoned to a suspected case of insanity, finds it often necessary to ask himself the question, is the person drunk or mad? "In the early stage of insanity," says Dr Haslam, a great authority on this subject, "the patient has *all the appearance of a person inebriated*." I consider this a very important feature in the incipient stage of this affection. It is a symptom which ought never to be forgotten; as in insanity, so at the commencement of intoxication there is generally a slight derangement of the perceptions. The person sees double, and yet he is conscious that the illusion of sight is but the result of the stimulus in which he has been indulging. In this incipient state of drunkenness it is not uncommon, as Crichton observes, to see some young philosophers and students making the experiment of first shutting one eye, and then the other, with a view of discovering whether the vision be really affected. In this incipient stage the person has sufficient judgment left to conduct himself with propriety, although the control over the muscles of voluntary motion is partially suspended. His answers to any question that may be put to him are distinct and rational. If he recurs again to the bottle, a greater amount of intoxication is exhibited, and he talks idly and unreasonably; vociferates loudly; speaks in broken and incoherent language; swears; laughs; and appears to have lost all command over his actions.

In insanity, the memory appears to be the first faculty of the mind implicated. Before there is any visible departure from the patient's usual habits—prior to any marked change in his feelings towards his friends and relatives, it will be found that a complaint will be made of an inability to remember circumstances of recent occurrence. He can fix nothing on the memory. The mind reverts to the scenes and events of past life; and often the illusion, when it manifests itself, is connected with events of by-gone days. In advanced insanity, this is also the case. The mind will revel in the scenes of early life; and impressions which had long since been apparently effaced from the mind, will be revived with vividness and reality. How beautifully has the magic genius of Scott delineated this feature of insanity in his inimitable portraiture of Madge Wildfire! During her insanity, how wonderfully her imagination adapts itself to the circumstances of her previous life!

Insanity is often ushered in by great and unnatural exuberance of animal spirits, without there being any apparent cause for the sudden elevation. Dr Monro, in his reply to Dr Battie, has described with great accuracy these symptoms. He says—

"*High spirits*, as they are generally termed, are the first symptoms of insanity in many cases: these excite a man to take a larger quantity of wine than usual; and the person thus afflicted, from being abstemious, reserved, and modest, shall become quite the contrary, drink freely, talk boldly, obscenely, swear, sit up till midnight, sleep little, rise suddenly from bed, go out hunting, return again immediately, set all his servants to work, and employ five times the number that is necessary; in short, everything he says and does betrays the most violent agitation of mind, which it is not in his power to correct; and yet in the midst of all this hurry he will not misplace one word, or give the least reason for any one to think he imagines things to exist that really do not, or that they appear to him different from what they do to other people. They who see him but seldom, admire his vivacity, are pleased with his sallies of wit, and the sagacity of his remarks; nay, his own family are with difficulty persuaded to take proper care of him, until it becomes necessary to do so from the apparent ruin of his health and fortune."

In many cases the experienced eye of the medical practitioner may be able to detect the existence of latent insanity. In such instances the patient evinces no evident indication of any irregularity of mind. His dearest friends and constant companions can perceive no alteration in manner sufficient to excite a suspicion of insanity. Occasionally the patient may manifest a strangeness and oddity of conduct, which is, however, but little noticed. The individual may, notwithstanding, be suffering from the incipient symptoms of derangement. He has not altogether lost all power of controlling his feelings or ideas; an internal struggle may be going on between what he knows to be a fact, and the false conceptions which almost like an avalanche are forcing themselves upon the mind. None but those who have gone through this dreadful ordeal can form an accurate notion of the mental agony which a person so unhappily situated experiences! Dr Darwin relates the case of a most elegant lady who suddenly became melancholy. She retained, however, so great a command over herself, that she was enabled to do the honours of her table with grace and apparent ease. After many days' entreaty, she informed her physician that she thought her marrying her husband had made him unhappy (though it was a love match on both sides), and that this idea she could not efface from her mind, day or night. It is astonishing for what a length of time a patient under such circumstances will struggle against a delusion which is endeavouring to *fasten* itself upon the mind. In such cases the patient gives no marked indication of mental unsoundness; she will attend to her domestic duties, mix as usual with parties of pleasure, take her accustomed seat at the Opera, and yet manifest no sign of the tempest raging within. How often do such patients confess to the medical practitioner, when the state of mind becomes so apparent as to compel the friends to summon relief, that for months they have been contending courageously against what they were conscious were erroneous perceptions. Hoping eventually to master these false ideas, they have concealed, from those in whom confidence ought to have been placed, their melancholy condition. This state of mind is fraught with much cerebral mischief. It cannot exist for any length of time without serious consequences ensuing. To such I would say—

"Give sorrow words.
The grief that does not speak,
Whispers the o'erfraught heart and bids it break."

Could such persons be persuaded to unburden their minds—to give expression to their feelings—to seek from a medical friend, in whose judgment they could confide, that advice which is needed under such circumstances—how much misery and wretchedness would be prevented! But, alas! weeks and months are often allowed to roll on before the friends have the slightest conception of the presence of mental infirmity. The delusion may be suddenly evinced,—in an instant, the insane idea which has been weighing upon the mind, exercising almost a demoniacal influence over the individual, developes itself. In many cases, as I shall presently explain, the first sign of the insanity may be in an attempt to commit self-destruction, and then the friends of the patient exclaim, "How could we have been so blind? Why did we not perceive the evidences of derangement, and subject the patient to proper medical treatment?" I wish to impress this important fact upon the attention of those interested in this subject, that in every case of this description there are symptoms which are sure and certain indications of the state of mind to which I have been alluding. Examine the history of the cases of Sir Samuel Romilly, or the Marquis of Londonderry. In both these instances suicide might have been prevented, had proper medical assistance been afforded. There were in these two instances the well marked premonitory symptoms of suicidal insanity, which would have yielded to the use of remedial agents. In such cases let this fact never be lost sight of—it is an invaluable axiom with regard to disordered intellect—no deviation from a healthy state of the mind can take place, without its being the effect of a physical derangement going on in some part of the body. Having once detected the mental infirmity, it becomes the duty of the physician to discover the seat of the physical lesion ; this will establish the necessity of applying for assistance in the earliest dawnings of mental derangement. I again assert that the experienced and intelligent practitioner, who has paid proper attention to this subject, will be able without much difficulty to discover the presence of the incipient stage of the disease.

For some time prior to the existence of marked evidences of insanity, the patient is observed to neglect his ordinary occupations ; he manifests a restlessness of disposition ; the walk is characteristic ; the patient is often seen pacing and repacing the room. Dr Uwins says,—" I remember witnessing the case of a most wild and vindictive maniac in Bedlam, whose motions reminded me of those made by an infuriated animal, the walks of which are limited by the sides of his cage—these rapid strides and movements seem as if the individuals were anxious to throw off, as it were, an irritability which is greater than they can quietly endure." This symptom is often present in the early stage of the disease. The patient appears incapable of remaining long in any one situation—he is incessantly restless—he often rises much before his usual hour, starts off and takes a long walk without having any definite object in view.

" The coming on of madness," says Dr Haslam, " is marked by restlessness. Insane patients become uneasy, and incapable of confining their attention ; they neglect their accustomed employment ;—they get but little sleep : they are loquacious and positive on any subject that may be started ; —soon after they are divested of all restraint in the declaration of their opinion of those with whom they are acquainted ; their friendships are expressed with fervency and extravagance—their enmities with intolerance and disgust. They now become impatient of contradiction, and scorn reproof. For supposed injuries they are inclined to quarrel and fight with all about them. At length suspicion creeps into the mind ; they are aware of plots that had never been contrived, and detect motives that were never entertained : at last, the succession of ideas becomes too rapid to be examined ; the mind becomes crowded with thoughts, and indiscriminately jumbles them together : insanity is established. Patients (our author continues) under the influence of the depressing passions, will exhibit a different train of symptoms. The countenance wears an anxious and gloomy aspect ; they retire from the company of those with whom they had formerly associated, seclude themselves in obscure places, or lie in bed the greatest part of their time. They next become fearful ; and when irregular combinations of ideas have taken place, conceive a thousand fancies ; often recur to some former immoral act they have committed, or imagine themselves guilty of crimes they never perpetrated—believe that God has abandoned them, and with trembling await his punishment. Frequently they become desperate ; and endeavour with their own hands to terminate an existence, which appears to be an afflicting and hateful incumbrance."

Perhaps, among the most common of the early symptoms of insanity, I may mention a change in the feelings of the patient toward his relatives and friends. From being open and ingenuous, he becomes reserved and suspicious. He is peevish and quarrelsome. His aversion will be in proportion to his former attachments. He will exhibit an inveterate and uncontrollable dislike to those bound to him by the tenderest of human ties. In fact, as Dr Uwins justly observes, "the very excess of attachment often leads to horrible manifestations of excess." On this subject I cannot refer to a higher authority than that of Professor Georget. This physician has graphically delineated the early changes which take place in the feelings and affections of those labouring under the incipient stage of insanity. As this point is one of great importance, I offer no apology for the length of the quotation :—

"'Sometimes,' he says, 'the action of the cause is strong and rapid; at other times more moderate and slow. In the first case, madness breaks out at the end of some hours or some days, after a state of anxiety and uneasiness, with headache, sleeplessness, agitation or depression, and threatening of cerebral congestion; the patient begins to babble, cry, sing, and becomes agitated and wild. He is then often taken for a person in a state of intoxication, and the mistake becomes apparent only after examining the previous circumstances and the duration of the malady. In the other case, thought only becomes affected gradually, and often very slowly; the patient is generally conscious of some disorder in his intellectual faculties; he is beset by new and odd notions, and by unusual inclinations; he feels himself changing in his affections; but, at the same time, he preserves a consciousness of his condition, is vexed at it, and tries to conceal it; he continues his occupations as much as he can; and, lastly, as many people do in the first stage of intoxication, he makes every effort to appear reasonable. Meantime his health continues to give way, and he either sleeps less or loses sleep altogether; the appetite diminishes or disappears; sometimes digestion is difficult, and constipation supervenes; *en-bon-point* decreases, the features alter, the monthly discharge becomes irregular, weak, and at last is suspended. At the same time, the bystander remarks something unusual, and even extraordinary, in the tastes of the patient, in his habits, his affections, his character and his aptitude for business; if he was gay and communicative, he becomes sad, morose, and averse to society; if he was orderly and economical, he becomes confused and prodigal; if he had long abstained from the pleasures of love, he becomes the victim of insatiable desires, and either seeks to associate with the other sex, or has recourse to disgraceful practices; if he was moderate in his political and religious opinions, he passes to an extreme exaggeration in both; if he was open and candid, he becomes suspicious and jealous; if a wife, she regards with indifference her husband and children; the merchant neglects his business; tears and laughter succeed each other without apparent motive; the exterior of candour and modesty gives place to an air of conceit and assurance, which, especially in women, astonish us. But all these phenomena are less prominent than they may appear to be here, and unless the individual have been insane before, no one may suspect the nature of the ailment which torments him; all the questions put to him lead to no result, except that of fatiguing and giving him pain, for the ignorance which prevails in regard to insanity leads the friends to indulge in offensive insinuations, and to charge him with frivolous accusations, from not perceiving that he is under the influence of disease and not of reason. Sometimes the appetite either remains entire, or is speedily recovered, as well as digestion, nutrition, &c.; and it is in these circumstances that the conduct of the patient gives rise to a host of interpretations on the part of the parents and public.

"'This period of incubation of mental alienation, during which the true state of the patient is generally misunderstood, or not appreciated, may last a long time. M. Pinel relates, that a man who believed his wife to have been ill only six months, the period of the invasion of furious delirium, agreed, after a multiplicity of questions, that the disease must have been going on for fifteen years. The same author mentions elsewhere, that in several instances the maniacal, or melancholic state, has begun four, six, ten, or even fifteen or twenty years previously. It is often easy to go back months, or years in this way, and we finish by discovering that circumstances, taken for causes by the friends, are frequently only the consequences of unobserved disease. In fact, it often happens at that period of the malady, that a slight contradiction, or paroxysm of anger, or some cause equally insignificant to a person in good health, provokes the immediate and complete subversion of reason, and gives rise to mistakes as to its true cause and duration. M. Esquirol has observed, and pointed out this very successfully.'"*

Insanity occasionally first exhibits itself in violent fits of rage. This feature is manifested in the case of King Lear. Again, as I have previously observed, suicide is often the first overt act of insanity. We have no indication of the presence of the malady, until the unhappy patient makes an attempt upon his own life. The insanity of Hamlet is evinced by an unusual *tedium vitæ,* with a propensity to commit self-destruction. In the case of Hamlet, the disposition to suicide was overpowered by religious apprehensions.

In suicidal mania, as in other descriptions of insanity, the deranged propensity may lie dormant for some period. In such cases there can be no doubt as to the fact of the mind being in an unsound condition. The idea of suicide has been known to haunt the imagination for a considerable length of time before the act is finally attempted. A woman occupied herself for several successive weeks in collecting minute portions of corrosive sublimate, with which she poisoned herself and three of her children. A gentleman obtained a grain of opium *per diem* for 80 days, under the pretence that he could not sleep without it. He then swallowed the whole of it, and killed himself.

A propensity to indulge to excess in intoxicating drinks is often the earliest sign of disordered mental health.

Associated with the symptoms previously enumerated, the patient often fancies he hears strange voices calling him, or he sees objects which have no existence except in his imagination. Insanity is often first suspected to be present in consequence of the existence of an hallucination or illusion similar to those just specified. The patient will complain to his physician of having a sensation of weight in his head, or a tightness across the forehead. He expresses an inability to regulate the train of thought. Ideas of a painful and often revolting character rush upon the mind. He is subject to internal impulses which he finds difficult to combat. He forsakes his old associates —becomes either abstracted and retired in his habits, or extremely loquacious and communicative to strangers. From being penurious, he will suddenly become very extravagant. Patients are often observed to talk out loudly to themselves. There is a peculiar expression of eye and countenance which is generally present in these cases. I have seen patients, before insanity has been fully developed, notice the "blazing up of the countenance," as it has been termed, and express a horror of approaching derangement of mind.

In many cases the moral faculty may be alone implicated in disease,— the intellect being sound. Under these circumstances there will be no intellectual delusion. The individual may be capable of exercising great strength of reasoning power, whilst he is clearly and palpably suffering from moral insanity, exhibiting itself in a perversion of that principle which regulates our actions as moral and responsible agents.

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* 'Dictionnaire de Médecine,' tome ix. p. 214.

It is a fallacy to suppose that it is necessary, in order to establish the presence of insanity, to prove the existence of what is termed a delusion of the intellect.

Idiots, although deprived of all powers of intellectual exertion, yet often exhibit a considerable amount of benevolence and kindliness of disposition. There are such things as moral idiots; persons possessing intellect, whilst they are totally deficient in moral principle.

It may be difficult in many cases to draw a line of demarcation between actions which result from moral insanity, and over which the person has lost all control, and those which spring from vice in the ordinary acceptation of the term, and which justify us in considering the individual amenable to punishment. Yet such a distinction can and ought to be made. I am ready to admit that great difficulties beset this investigation; yet a consciousness of this ought not to deter us from this inquiry. The ground is dangerous; but it is not altogether impassable.

Moral insanity may manifest itself in either an uncontrollable desire to commit some crime, or it may exhibit itself in actions essentially vicious and depraved. A propensity to sacrifice human life is the most common form in which this description of insanity is manifested.

Moral insanity is defined by Pritchard to "consist in a morbid perversion of the natural feelings, affections, inclinations, temper, habits, and moral dispositions, without any notable lesion of the intellect, or knowing and reasoning faculties, and particularly without any maniacal hallucination." All our established works on Insanity are replete with illustrations of this species of madness. I shall only cite a few cases on this point:—

Dr Elliotson says, when he was at Cambridge there was a person who was said to have attempted three times to set fire to the University. It was ascertained that, when he was young, he had attempted to drown a child; yet nobody ever suspected him of being mad. The case of Mr and Mrs Bonar, who were murdered at Chiselhurst, in Kent, by the servant, is not forgotten by the public. The murderer was a footman in the family; and, one night, he left his room, went up stairs to the apartment of his master and mistress, and beat their brains out with a poker. He was asked his reason, but could give none. He said he had always been treated by them with the greatest kindness, but he felt suddenly in the night a desire to kill them; and he supposed the devil had prompted him to the act. No other symptom of insanity had been detected in him; and he was hanged. Dr Gall mentions the case of a person at Vienna who went to witness an execution, and was seized with a propensity to kill. At the same time he had a clear consciousness of his situation. He expressed the greatest aversion to such a crime. He wept bitterly; struck his head; wrung his hands; and cried to his friends to take care, and get out of his way. He felt the inclination, repelled it, and entreated any person to prevent his doing mischief by putting him into prison. Pinel mentions the case of a man who exhibited no unsoundness of intellect; but who confessed he had a propensity, in spite of himself, to commit murder; and his wife, notwithstanding the tenderness he felt for her, was near being murdered by him;—for he had only time to warn her to fly. In the interval he expressed the same remorse; felt disgusted with life; and attempted several times to put an end to his existence. In a work by Mr Hill, a case is related of a man who was tried at Norwich, in 1805, for wounding his wife, and cutting his child's throat. He had been known to tie himself with ropes for a week, to prevent his doing mischief to others. One of the members of a family in London, is said to have used these words:—"Do, for God's sake, get me confined; for, if I am at liberty, I shall destroy myself and wife! I shall do it, unless all means of destruction are removed, and, therefore, do have me put under restraint! Something above tells me I shall do it; and I shall!" Arsenic was put into a pudding, and the maid-servant was executed for it; but many persons were perfectly convinced of her innocence.

Dr Gall mentions having seen a person in prison at Friburg, who had set fire to his house four times in succession; and who, after he had set fire to it, tried to put it out. Many lunatics have a strong propensity to steal. Gall says, that the first King of Sweden was always stealing trifles. Instances are mentioned of a German who was constantly pilfering; and of another who, having a desire to steal, entered the army—hoping that the severe discipline there would have the effect of restraining him. But he gave way to the propensity even there, and was very nearly being hanged. He then became a friar, with the same hope; but he still felt the same desire, and carried all the things he could to his own cell; but as he could get only trifles, he was not noticed. Gall also mentions the case of a person at Vienna, who, being in the habit of stealing, hired a lodging in which to deposit his thefts; and when he got a stock he sold them. He only stole household goods. The wife of a celebrated physician at Leyden never went into a shop to buy anything without stealing; and a Countess at Frankfort had the same propensity. Another lady, notwithstanding all the care with which she had been brought up, had the same desire to pilfer. It is stated of a celebrated physician, that his wife was always obliged to examine his pockets in the evening, and restore to his patients the things which he had stolen from them during the day. Meritz speaks of a criminal, who, at the moment he was about to be executed, stole the confessor's snuff-box. Dr Burner, who was one of the physicians to the King of Bavaria, speaks of a person who enjoyed abundance, and had been well educated; but who, notwithstanding, was always stealing; and was made a soldier by his father, and at last got hanged.*

Whenever this disposition is exhibited, and we feel it is the result of a morbid affection of the brain giving rise to a perversion of the moral sense, it is imperative on the part of the friends of the patient that the advice of a medical practitioner should be obtained, and proper precautionary measures adopted. "Perhaps," says Dr Mayo, "the difficulty of instituting a course of treatment or coercion, when the moral symptoms are either the prominent or the sole evidence of the disease, may account for their being considered as less worthy of notice. The aberrations of the *intellect* are easily made the subject of coercion: the very opposition of the patient is generally conducted in a manner establishing its necessity. A man whose insanity is of the heart, requires indeed the protection of coercive measures; but while he retains his intellectual powers, is very well able to resist their application."†

What, it may be asked, is to be done under such circumstances? In many cases of homicidal insanity, the practitioner will generally find, upon examination, the brain to be in a state of vascular congestion; for, as in instances of suicidal derangement, the disposition to commit acts of violence will almost invariably be found to be associated with cerebral irritation. In cases of this kind, the removal of a small portion of blood, and the administration of cathartics, will often have the effect of restoring the mind to a state of health. Many patients, who have been seized with a suicidal or homicidal impulse, have retained sufficient self-consciousness to implore their friends and relatives to subject them to medical treatment.

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* Dr. Elliotson's Lectures.

† Dr. Mayo's 'Theory of Morals applied to Insanity.'

There are cases of moral insanity where the only indication of the disease is an uncontrollable disposition to indulge freely in intoxicating drinks. There is no doubt that in such cases the individual is not competent to exercise a sound understanding, and therefore ought not to be left to follow the dictates of his own morbid appetites. It would be difficult to persuade the friends of a person unfortunately addicted to this propensity, of the necessity of coercive treatment; yet there cannot be a doubt but that in many cases of this kind actual confinement is absolutely indispensable. Let the reader reflect upon the particulars of the two following cases, and then ask himself whether the friends of those unhappy men were not highly culpable for not subjecting them to temporary incarceration and medical treatment. The first case was that of a young man of fortune, 26 years of age. "Every morning," says Dr Macnish, "before breakfast, he drank a bottle of brandy; another he consumed between breakfast and dinner, and a third shortly before going to bed. Independently of this, he indulged in wine, and whatever liquor came within his reach. Even during the hours usually appropriated to sleep, the same system was pursued—brandy being placed at the bed-side for his use in the night time. To this destructive vice he had been addicted since his sixteenth year; and it had gone on increasing from day to day till it had acquired its then alarming and incredible magnitude. With the perfect consciousness that he was destroying himself, and with every desire to struggle against the insatiable cravings of his diseased appetite, he found it utterly impossible to offer the slightest opposition to them. In another case a person was ruining his health by habits of intemperance, and upon being expostulated with, he replied, 'My good friends, your remarks are just; they are indeed too true; but I can no longer resist temptation. If a bottle of brandy stood at one hand, and the pit of hell yawned at the other, and I were convinced that I should be pushed in as sure as I took one glass, I could not refrain."* These were cases of decided moral insanity. Esquirol has distinctly admitted the existence of a species of mental derangement in which the abuse of intoxicating drinks and drunkenness are the first symptoms. In these cases, where the malady shows itself in a propensity to drink to excess, there will generally be found a physical lesion in some portion of the abdominal viscera, which acts as a constant source of irritation to the brain and nervous system. A chronic inflammation is set up either in the liver, stomach, or villous coat of the intestinal canal, which, if allowed to remain unattended to, must necessarily affect the brain and give rise to serious cerebral disease, manifesting itself in symptoms of alienation of mind.

Before considering minutely the moral and physical treatment of the early stage of disordered mind, I would make a few observations with reference to the curability of insanity generally.

There cannot be a more mistaken notion, or one more calculated to do a large amount of mischief, than that which conveys the idea that in the majority of cases of insanity the patient is placed beyond the reach of remedial measures. At one time few had the courage to avow that insanity was a curable disease at all. The treatment to which this unfortunate class of human sufferers was exposed, fully justified the belief in the incurability of the malady. Directly a person manifested indications of disordered intellect, he was hurried off to a madhouse—

> "Regions of sorrow, doleful shades, where peace
> And rest can never dwell, hope never comes,
> That comes to all———"

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* 'Anatomy of Drunkenness.'

and compelled to herd with lunatics labouring under all the stages of insanity. No regular course of medical or moral treatment was pursued; and if the medical practitioner did attempt to administer to the "mind diseased" through the media of the material organization, it was under such circumstances that a cure could never reasonably be expected.

Our notions, however, with regard to this disease, have undergone an important revolution; insanity is now considered to be only a derangement of the *manifestations of the mind*, resulting from corporeal disease, and to be as much amenable to medical treatment as the diseases of other organs of the body.

There are, certainly, stages of insanity associated with serious structural disease, in which the physician is baffled in his attempt to restore the patient to health; but even under these apparently desperate circumstances, when every gleam of hope appears to have vanished, the adoption of judicious measures will occasionally succeed in producing a natural action of the cerebral functions.

Sir Henry Halford says,—"If medicine be less useful in the confirmed stages of insanity, it is also little so in the advanced stages of other chronic disorders. In cases of incapacity of the joints, with painful swellings upon them, from chalk stones, after repeated fits of the gout, medicine has no effect upon these depositions; yet this is no argument against the use of medicine in the first attacks of gout, to prevent, if possible, such dismemberment and deformity. Again, in the instance of palsy, when a patient has lost the use of half his body, in this stage of his complaint medicine has very little sensible effect upon it; but if the patient be assisted in the earliest attacks of his malady, whilst under apoplexy, which generally precedes palsy, not only may his life possibly be saved, but the paralytic symptoms prevented altogether, or at least considerably mitigated."

The medical man must be extremely cautious in pronouncing a prognosis in these cases. Even the most experienced physicians are often deceived as to the duration and probable termination of an attack of mental derangement. There are, however, certain well established principles which every practitioner should be conversant with, and which he will find materially to assist him, when called upon to give an opinion as to the probability of recovery.

In cases where there exists a strong hereditary predisposition to insanity, the chances of recovery are against the patient. Should the insanity be suddenly developed, and be manifested by violent and furious maniacal excitement, the prognosis will be more favourable than if the disordered mind advanced by slow and insidious degrees. In the latter case we have reason to apprehend the existence of serious organic disease of the brain, which has been gradually developing itself. Insanity, attended with great depression of mind or melancholy, or complicated either with epilepsy or apoplexy, or coming on in advanced life, or when it is the result of injuries inflicted on the brain, is extremely difficult of cure. When the patient indulges to excess in the habit of abstraction, the medical practitioner has much to apprehend. Erroneous notions connected with religion are said to indicate the existence of incurable derangement of mind; but this cannot be laid down as an invariable rule. In forming our opinion as to the duration or curability of the disease, we must ascertain whether the patient has ever manifested symptoms of insanity previously; if so, we must be cautious in pronouncing judgment. First attacks generally yield sooner to medical treatment, particularly if advice be obtained in the early stage, and the patient is not of an advanced age. M. Pinel had no recollection, during the whole period he was associated with the Bicêtre, of more than *one* case of insanity which was cured after the age of *forty*. The following table, which Dr Haslam formed as the result of his long experience at Bethlem Hospital, will convey to the mind an idea of the influence which different periods of life have over the curability of insanity.

Between the age of	10 and 20	admitted	113	cured	78	not cured	35
	20 and 30		488		100		288
	30 and 40		527		180		347
	40 and 50		362		87		275
	50 and 60		143		25		118
	60 and 70		31		4		27

Should the patient exhibit any remissions of the malady, the indication may be looked upon as favourable; for then the medical man will be justified in inferring that the brain has not undergone any very alarming changes of structure; that the cerebral organ is not permanently disorganized. Insanity occurring in inveterate drunkards is exceedingly difficult of cure. Delirium tremens is, however, often successfully treated.

The management of the early stage of insanity requires on the part of the physician great delicacy, discrimination and judgment. Under these circumstances, where the brain is in an irritable condition, and the mind is struggling between sanity and insanity, the person being conscious that his "wits" are beginning "to turn," the medical attendant should proceed cautiously in his examination. If the patient is led to believe, from the conduct of the physician or from anything which falls from him, that derangement of mind is suspected, the most painful and disastrous consequences may ensue. In the early stage of insanity the patient's suspicions are morbidly excited. He has a dread of "going mad," expresses a horror of such a calamity, and often most positively refuses to allow himself to be questioned on the subject of his health. Should the patient believe that he is suspected to be deranged, he will sometimes exhibit great violence and excitement, and denounce his friends and family, charging them with a conspiracy against his life and liberty.

Mr J. Dyer, a man of most excellent character, manifested signs of disordered intellect. A short period prior to his committing suicide he suddenly exclaimed to his servant,—"Who do you stare at? I am not out of my mind; if you are, I am not."

If the practitioner proceeds judiciously in his inquiry, he may generally succeed in effecting his object without inducing the patient in the slightest degree to suspect the purpose for which his advice has been obtained. In many cases the physician may administer proper remedial agents, and succeed in warding off an attack of violent mania, without conveying to the mind of the patient the faintest intimation of the suspicions which exist as to the presence of mental impairment. When a medical man is called in to a case of this description, it is his duty first to direct his observations to the state of the general health. He will almost invariably detect either hepatic, gastric, or intestinal disorder, which may be irritating the brain. By the timely use of medicine, this may be removed, and the patient restored to mental health. It should be the endeavour of the physician to obtain the confidence of his patient. This may, without much difficulty, be effected, if he acts with kindness and gentleness towards the invalid.

In slow and insidious affections of the mind, the liver will often be found to have been for a considerable period the seat of disordered action. A few doses of blue pill—regulating the diet—agreeable society—abstinence from all powerful stimuli—will in a large number of cases be the most efficacious means of cure in the premonitory stage of mental derangement. Very frequently it is necessary to relieve the overloaded condition of the vessels of the brain. The patient generally complains of pain in some part of the head, attended with an increase of temperature, for which the application of a few leeches, or cold spirituous lotions, may be recommended. Great caution is, however, necessary in the use of depleting measures. Medical practitioners who have not had the advantage of much experience in the treatment of this class of affections, are too apt to infer, when called in to a case of insanity exhibiting itself in violent paroxysms, the necessity of both general and local bleeding. Alas! how often have patients, who have been so injudiciously treated, sunk into incurable chronic melancholy. In recent attacks, occurring in young and plethoric subjects, when the symptoms are closely allied to inflammation of the brain, bloodletting is often attended with the most happy results; but it requires a nicety of discrimination to draw a line of distinction between vascular excitement and the symptoms which follow a concentration of nervous energy in the brain, and which require for their removal an opposite mode of treatment. Indiscriminate abstraction of blood is much to be deprecated; idiotcy often supervenes upon it. Bloodletting, however, in the very early period of insanity, is often successful in putting an effectual stop to the progress of the malady. In very nervous subjects, of delicate fibre, where there is not evidently an increased impetus given to the circulation, depletion will not be required. In considering the physical treatment of insanity, it is essentially necessary that we should understand distinctly upon what condition of the brain the morbidly excited state of the mind is dependent. I think the principle may be safely laid down, that, as a general rule, the brain, in cases of mania even of the most exalted kind, is not necessarily in a state of inflammation. The character of insanity, the symptoms which usher it in, and which mark its progress, all unequivocally establish that the alienation of mind arises from a cerebral disease, unaccompanied with vascular excitement. Inflammatory disease is attended with symptoms which are peculiar and well marked. In such cases we have fever, quick pulse, intense pain of the head, intolerance of light, and often violent delirium. How often do we see the mind most violently excited, without there existing one symptom which would justify us in the conclusion that inflammation of the brain is the cause. In *delirium tremens* there is often a furious state of delirium, which may exist during the whole course of the disease, manifestly unconnected with a vascular or inflammatory state of the brain. In cases of delirium tremens, or the drunkard's delirium, as it is termed, we depend for its cure almost entirely upon those remedies which would be highly injurious if inflammation of the brain were present. In attacks of this kind we rely principally upon large doses of opium, and often we are compelled to administer brandy and other powerful stimuli. In many cases of insanity there is a high state of mental excitement, which is most successfully treated by agents which would, under ordinary circumstances, increase inflammatory action. There are, however, cases of mental derangement in which a subacute inflammatory state of the brain is present, and for the removal of which active measures may be required.

Sir A. Morison observes,—"Bleeding is principally indicated, in mental diseases, where increased action or congestion is accompanied with plethora or suppressed discharges, by decided inflammatory affections of the contents of the head, thorax, or abdomen, and when the insanity is the effect of external injury or insolation."

The more nearly the maniacal symptoms approach those of inflammation of the brain, the more justified will the physician be in recommending general bleeding. In cases of young females of full habit of body, in whom the natural secretions are suppressed, and where the skin is dry and hot, the pulse rapid and inflammatory in its character, the conjunctiva and face red, the pupil contracted—and, in fact, where the symptoms of phrenitis are present,—bleeding may be practised with much service. In many such cases, however, should any doubt exist upon the mind as to the propriety of abstracting blood, the practitioner would not be warranted in bleeding from the arm—leeches should be locally applied to the neighbourhood of the head.

As an excellent substitute for bleeding, large nauseating doses of *emetic tartar* may be exhibited. Violent maniacal excitement, accompanied by every apparent indication of a high degree of cerebral inflammation, will speedily yield to the administration of this potent drug. The physician should begin with small doses, and gradually increase them, until the patient is able to take two or three grains without exciting vomiting. If there be unequivocal signs of inflammatory action in the brain, the straining which would result from continuous vomiting would be highly prejudicial. But in the majority of these cases, the pathological condition of the brain will not require active antiphlogistic measures for its removal.

In very recent cases, where the attack comes on suddenly, and is attended with the stoppage of accustomed discharges, or the disappearance of an eruption, conjoined with symptoms of plethora, bleeding will often effect a speedy cure. But the previous history of the case ought always to be taken into consideration. When the derangement of mind is the effect of long-continued grief—loss of sleep—anxiety of mind—religious despondency—physical disease of the abdominal viscera, or chronic indigestion causing melancholy,—the treatment must not be of an antiphlogistic kind. In many of these cases the patient has been known to complain, for some period before the deranged state of mind has attracted observation, of disordered sensations. The mind has acted irregularly—the ideas have been confused, and the patient will be annoyed by slight *ocula spectrá*. How often is this the first symptom of approaching or actual insanity! The patient will not only fancy he sees objects, but he will also complain of hearing strange noises. In these cases there will generally be found local congestion in the neighbourhood of either the optic or the auricular nerves. A few leeches applied to these parts has often been known to remove, almost immediately, these illusions of the senses.

On the subject of depletion in insanity, Dr Seymour observes,—"In the great majority of cases, the functions of the brain, in mental derangement, are increased in force, while the circulation is depressed, extremely quick and feeble, and the action of the heart gives way to the smallest abstraction of blood; and yet these are often attended by raving delirium, great increase of muscular force, and are, in fact, what are termed *high* cases. The consequences of such practice is, either the more frequent return of the high stage, or the patient sinks into one approaching idiotcy."

Cold applications to the head have been attended with the happiest results, in cases of violent cerebral excitement. Cold has powerful sedative properties. When bleeding is inadmissible, cold applied to the neighbourhood of the brain will be found not only to diminish vascular excitement, but to lessen powerfully the morbid sensibility of the cerebral organs. Should there, however, exist a tendency to plethora or to apoplexy, cold applications must be used with great caution. The cold bath in conjunction with the *douche* will be found most efficacious in subduing maniacal excitement. I have witnessed the mental perturbation of incipient insanity almost instantly yield to this potent remedy. The *douche* may either be used when the patient is in or out of the bath. Should the medical practitioner not have by him a proper apparatus, he will find cold water poured out of the mouth of a kettle, from a height, on the head, answer the purpose.

The shower bath has also been found very advantageous. In melancholia the warm bath must be substituted. Judging from the beneficial effects of cold and warm bathing in cases of irritation of the mind, caused by cerebral disease, I should feel disposed to consider that the steady use of these remedial agents would, in incipient derangement, be accompanied by the happiest results. It is much to be lamented that the practice of regular bathing is not more generally adopted in this country. The state of the mind is closely dependent upon the condition of the cutaneous secretion. I should recommend those who are subject to mental depression, hypochondriasis, the vapours, ennui, or by whatever designation it may be termed, to try the effect of systematic bathing. I feel assured that, in many instances, violent attacks of insanity may be warded off by the use of the warm or cold bath. In cases of cerebral irritation, evidently the result of a tendency to vascular excitement, bathing the head regularly every morning with cold water or vinegar and water will be followed by great benefit to the health of the body as well as the mind.

In incipient, as well as in advanced insanity, the physician should be particular in directing his attention to the state of the bowels. The administration of purgatives has often been known to have the effect of relieving the mind without there being any necessity for the exhibition of other medicines. Effective as this agent is in tranquillizing brain excitement, much caution must be exercised in its application. Very frequently the whole surface of the mucous membrane of the intestinal canal is in a state of sub-acute inflammation, which, acting sympathetically upon the brain and nervous system, keeps up mental irritation. Under these circumstances, the mildest kind of aperients must be given. Were we to administer drastic purgatives, the most disastrous effects would ensue. When this condition of the intestines is present, the use of aperients should be preceded by the application of a few leeches, (particularly if there be pain upon pressure,) or counter-irritants, to the neighbourhood of the abdominal affection. In many cases, however, it will be necessary to exhibit drastic purgatives. Insanity has been known to give way to the steady and persevering use of cathartics. Hellebore had in ancient times the reputation of being a specific in cases of insanity. It was considered to operate powerfully in cleansing and invigorating the intellectual faculties. It is said that Carneades, the Academic, when preparing to refute the dogmas of the Stoics, went through a course of white hellebore. So celebrated was this medicinal agent as a remedy for affections of the mind, that the Latin poets have sung its virtues. Horace, in allusion to the "happy madman," says—(I give Francis's translation—)

> He, when his friends, at much expense and pains,
> Had amply purged with hellebore his brains,
> Come to himself—"Ah cruel friends!" he cried,
> "Is this to save me? Better far had died,
> Than thus be robbed of pleasure so refined,
> The dear delusion of a raptured mind."

Persius also alludes to the fame which this medicine had acquired in cases of disordered mind. In his fourth satire, he tells Nero, that instead of taking upon himself the great and weighty task of government, which required much experience and sound judgment, he ought to take the most powerful medicine to clear his understanding.

—"*Anticyras* melior forbere meracas."*

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* The islands of Anticyra were famous for producing hellebore. The above quotation from Persius has been thus translated by Dryden:—

> "Thou hast not strength such labours to sustain,
> Drink hellebore, my boy—drink deep, and purge thy brain."

Melampus, the son of Amythaon, is said to have cured the daughters of Prœtus, king of Argos, of melancholy, by purging them with hellebore. According to the traditionary fable, Melampus had observed that the goats who fed on this plant were purged; and having administered it to the king's daughters, who were wandering in the woods under the delusion that they were cows, he cured them, and received the hand of one of them in marriage and a part of the kingdom of Argos as his reward. This purgative drug is now occasionally used in cases of insanity, but modern experience does not confirm the views entertained by the ancients respecting its pre-eminent virtues.

Emetics have been much lauded as a specific for the cure of insanity. Occasionally the administration of an emetic in the early stage of the attack will be found of much service. Should, however, symptoms of cerebral congestion be present, emetics will not be admissible. In religious melancholy, attended by defective circulation of the abdominal vessels, an emetic may be taken with every prospect of relief. When the brain is in a state approximating to inflammation, emetics cannot safely be given. Perhaps the most powerful agent that can be administered in the early period of insanity, with the view of subduing mental excitement, is camphor. This medicine often acts as a charm in the incipient stage.

The different preparations of opium are found of essential benefit, in insanity unattended by vascular congestion of the brain. The *liquor opii sedativus* or the *acetate of morphia* may be exhibited for the purpose of quieting and calming the nervous system. When bleeding is considered necessary, a full dose of opium administered immediately after the abstraction of blood will be followed by much benefit. Dr Uwins professes, that under these circumstances opium gives a tone and resistance to the capillary vessels which proves preventive of re-action, and consequent inflammation and effusion. Many medical practitioners are fearful of giving an opiate during the existence of violent cerebral and mental excitement. But what is the practice in cases of *delirium tremens*, an affection the prominent symptom of which is intense delirium? In this disease we depend mainly upon large doses of opium.

Hyoscyamus has had a very high reputation in cases of mental derangement. Very frequently it will be found to create sleep without having an injurious effect on the bowels. Sleeplessness is a symptom of approaching insanity, and it is one which ought to be strictly guarded against. Dr Combe, when speaking of the early signs of mental disease, observes, that "if those who are exposed to any of the exciting causes of cerebral disease, or of insanity, put themselves on their guard to secure regular sound sleep, they will do much to ward off the attack. The moment the cause begins to excite sleeplessness by night, and restlessness by day, with an involuntary direction of the mind in one channel, at first perhaps only perceptible to the patient himself, it is time to take alarm, and, if possible, remove or counteract its agency." Much caution, however, must be exercised in the use of opiates. They should never be taken unless advised by a medical practitioner. The injudicious use of this powerful drug might engender habits which it would be difficult to eradicate.

Much of the distressing nervousness, hypochondriasis, and lowness of spirits, which the physician is daily called upon to witness in what is termed "high life," and which approximates so closely to the confines of insanity, are clearly to be traced to the most pernicious and criminal habit of opium eating. It is lamentably too true that this destructive practice has much increased in this country of late years. If the poor man endeavours to destroy all consciousness of the mental and physical sufferings which result from pecuniary embarrassments by flying to the dram bottle, the man of wealth and fashion, sinking under the depressing influence of *ennui*, seeks in opium a solace and remedy for all his imaginary ailments. It has been maintained by high medical authority in this country, that the habit of opium eating has extended in a ratio to the establishment of Temperance Societies. Habitual drunkards, having pledged themselves to abstain from intoxicating drinks, have recourse to opium, with the view of keeping up that unnatural excitement to which they have for so long a period been accustomed. Opium has taken the place of wine, and laudanum is substituted for the gin bottle. I do not make these observations with the view of questioning the moral and physical advantages which have resulted from the organization of the associations for the encouragement of temperance. Far from it. It is my sincere belief, founded on long practical observation, that the societies in question are sowing the seeds of a moral revolution, which must inevitably enhance considerably the happiness and prosperity of the people of this great country. I refer now to the subject for the purpose of expressing my unqualified opinion with regard to this destructive propensity. It may be a question whether opium eating tends to shorten the span of human existence; but whatever views may be entertained on this point, no medical man practically conversant with the diseases incident to human nature, can hesitate an instant in admitting that the habit of opium eating cannot be indulged in without endangering the mental and bodily health. If actual, tangible, appreciable disease cannot be detected, it will require but little penetration on the part of the practitioner of medicine to perceive the insidious but certain organic changes which are taking place. I again assert that this habit undermines the health of the brain and nervous system, and gives rise, in many instances, to most distressing mental derangement. Like spirit drinking, opium eating exalts the sensibility of the brain, and thus predisposes it to the influence of those causes which so commonly derange its manifestations.

In numerous instances it is advisable to exhibit narcotics by what is termed the endermic method.

Among other physical remedies which have been recommended in cases of insanity, I may refer to belladonna, conium, hydrocyanic acid, iodine, mercurials, digitalis. It is not my intention, and in fact it would not come legitimately within the scope of this essay, to point out minutely the conditions of the system requiring the administration of the remedies specified. Much must be left to the judgment of the practitioner, who will be directed in their application by the peculiar circumstances of each individual case presented for his consideration.

Occasionally blisters and setons will have to be substituted for general or local bleeding, or used in conjunction with those remedial measures.

Before dismissing this part of the subject, I would make a few observations on the necessity of separating the patient from his friends and family, and consider briefly whether coercion is ever advisable in these cases.

There cannot be two opinions among experienced medical men as to the propriety of occasionally recommending that a patient suffering from mental disorder should, immediately the malady manifested itself, be removed from all his former associations. As a *principle* of treatment, no sensible physician will refuse his assent to it. The object of treatment is to break through the morbid train of thought; and as long as the patient is permitted to be surrounded by circumstances likely to encourage the peculiar feelings and ideas which constitute his delusion, so long will the efforts of the medical adviser be thwarted.

In many instances, no physician would be justified in undertaking the treatment of a case of insanity without receiving from the friends and family of the invalid absolute and unconditional permission to isolate him completely from his home and all with which he had been previously connected. The patient may fancy (and this is one of the peculiar features of the disease) that his family are conspiring against his life—he may imagine that his house is daily visited by persons engaged in devising schemes for depriving him of his liberty and property. The physician himself would give indications of mental unsoundness, were he to attempt to combat with the mental derangement under such circumstances. The patient must be removed from the sphere of his own circle, before any permanent advantages are likely to ensue from medical or moral treatment. Cases no doubt frequently occur, in which the practitioner would not be justified in recommending the unhappy patient to be incarcerated in an asylum. When the attack is recent, and is evidently dependent upon physical causes, and those causes are unconnected with any family circumstances, every means should be tried before separation from home is even suggested. Should, however, the friends be advised to send the patient to herd with other mad patients, perhaps much worse than himself, before an attempt has been made to restore the mind to its healthy balance, an attack of insanity which would only have been temporary in its character and short in its duration may be rendered either extremely protracted or incurable. In incipient insanity, where the individual retains a perfect consciousness of his infirmity, confinement in a madhouse would be absolute cruelty, if not criminality. I firmly believe that many patients are driven into confirmed insanity, by being hurried prematurely to an asylum.

Even in the more advanced stage of mental derangement, it is not prudent, in many cases, to compel a patient to mix in the society of those labouring under violent maniacal excitement. The idea of being imprisoned in a madhouse is sufficient of itself to throw the mind off its healthy equilibrium. In the treatment of this affection the physician cannot too often be reminded of the fact, that in numerous instances in which the mind is unequivocally deranged, the individual has not lost all consciousness of his infirmity. He knows what is going on around him, is sensible of acts of kindness and coercion, and frequently deeply laments the injudicious conduct of his friends, in forcing him into the society of those whose language and conduct only tend to fix permanently on his mind his own morbid ideas.

How feelingly does Mr Percival write on this point. He says,—"They who have not been confined in a lunatic asylum, cannot conceive the dreadful and cruel suspense that delay, and not only neglect, but the refusal of every-day civilities, together with inattention to just and obvious complaints, occasion. They do not know our wants and fears, because they do not know the danger we are in. They may judge our danger, however, from what these men do, and from what they have done; they may judge what they dare to do, being encompassed, even more than a king, with a hollow impunity, and clothed in the deepest hypocrisy. They who have not endured this confinement, do not know how the very suspicion of being a lunatic, coupled with being cut off from all pecuniary resources, shuts the mind of others against sympathy, impedes the proffer of assistance and the exercise of protection, and aught but the show of pity. Neither how it embarrasses the suppliant in his applications for redress, awakens anxiety, excites mistrust, and closes the door of his hopes, whilst he finds himself left defenceless to the sarcasm and persecutions of those he is accusing. How much more fearful is such a trial for one who knows that he cannot plead innocency of lunacy, one who in mind and bodily health is weak, and therefore more exposed than another to follow a wrong course; exposed to suffer even from treatment which men in sound health might almost laugh at, still more from what he dreads from having experienced it, and against which he is exasperated; and also still more liable than the other to lose that gift lately lost, so dear now, being nearly restored to him,—the gift of a sound mind and convalescent health; perishing again from want of wholesome communion, shattered by assault, or insidiously undermined."

Let it not be thought that I intend to join in the foolish and absurd cry against establishments for the reception of the insane. That lunatic asylums have been subjected to much abuse, there cannot be a doubt. All human institutions, even when based upon the most enlarged principles of philanthropy, are liable to such imputations; yet no person would be justified on that account in denouncing them, and holding those connected with them up to public odium.

Much delicacy is often required in recommending the removal of a patient from his family and friends. It should never be suggested unless circumstances render such a step absolutely necessary. It should always be borne in mind that a very strong prejudice exists against what are termed "madhouses." This feeling no doubt arises from the recollection of the great cruelties which were formerly practised in these "Mausolea of the mind." A. Cruden, in alluding to his confinement in a private asylum at Chelsea, observes,—"No person could have a greater dread of anything than I had of being carried to St. Luke's." Whenever he approached that building afterwards, he returned thanks to God for having delivered him from that "dreadful place." In describing the treatment to which he was subjected when confined in an asylum at Bethnal Green, he observes,—"I was scandalously beaten about the face and head: such was the continual noise and profanity of the inmates, that the place resembled Hell more than anything else." He subsequently says, "the way to be mad is to be sent to a madhouse."

I refer to these facts to establish, that as long as so strong a prejudice exists against institutions set apart for the treatment of the insane, much caution must be exercised in advising the family of a patient to subject him to confinement. On this subject I cannot refer to better authority than that of Dr Combe. That physician justly remarks, that "the patient should never be sent to an asylum, when means of treatment are equally accessible, and the probabilities of his restoration equally great, at home. But if the nature of the derangement be such as to require that constant watchfulness and decided control which can only be obtained in an establishment devoted to this purpose, there can be no hesitation in deciding upon removal. In such circumstances, the comfort as well as the safety of the lunatic demand seclusion; and his feelings are less outraged by restraints put upon him by strangers, over whom he never exercised any authority either of affection or of duty, than by his own family or friends, on whose consideration he is conscious of possessing stronger claims, or whose sympathies he may hope to rouse by continued and persevering appeals to their kindness and to their former friendship. It is on this account that it is common to see maniacs, who, in the bosom of their own families, were all turbulence and outrage, become at once peaceable and submissive when taken charge of by strangers. And whether we look to the ultimate cure, or temporary comfort of the patient, it is assuredly an act of direct kindness towards him to withdraw him from the influence of incessant irritation, and place him where the temptation to excitement is diminished, and its room supplied by whatever can soothe and tranquillize."

It is not only of great importance that the medical man should direct his attention to the moral and physical treatment of the premonitory stage of insanity, but it is essentially necessary that the patient should be made fully to comprehend the principles developed in this chapter, and be induced to avail himself of professional assistance at the moment when he experiences those incipient aberrations of mind which are the certain precursors of serious cerebral mischief.

How much human wretchedness might be avoided, if those who are thus unhappily afflicted could be induced to reveal the first approaches of mental disorder. At this period of the disease, a slight course of medicine, a temporary seclusion from home—a few weeks travel in the company of an expecienced and intelligent medical man,—would, in many instances, be all that was necessary to restore the mind to health.

To further the object I have in view, I would suggest the propriety of forming establishments, distinct from lunatic asylums, for the reception of patients labouring under the incipient stage of insanity, where they would be subjected to that course of treatment which their individual circumstances required.

As long as so strong a prejudice exists against the ordinary and recognized receptacles for this class of patients, it will be difficult and indeed fruitless to attempt to persuade a person, manifesting only the premonitory signs of mental disease, to voluntarily incarcerate himself in a madhouse; and yet, when patients have overcome these objections, and have allowed themselves to be deprived of their liberty, much good has resulted.

I recollect having a long conversation with a patient of this description, confined in St. Luke's. He informed me that he was there of his own accord, and that he had several times been an inmate of that establishment. As soon as he was restored to health he returned to his friends, but he found himself only capable of withstanding a certain amount of mental excitement. Whenever he felt a return of his former symptoms of mental derangement, he instantly applied for admission into St. Luke's, in which place he remained until he was again restored to health. I had this conversation with him a few days previously to his leaving the hospital, and he expressed to me his conviction that he should not long enjoy his liberty.

In this particular case the person did not object to being confined in a madhouse. But how seldom do we witness this freedom from prejudice. No arguments could induce many, even when in the perfect enjoyment of health, merely to gratify curiosity, to visit a lunatic asylum; then how difficult must it be to persuade those labouring under nervous ailments, to subject themselves to temporary seclusion in order to be restored to mental health?

Much good might be effected by the patient who dreads the occurrence of insanity, consulting a kind and benevolent physician, who would listen to a history of his ailments, and suggest whatever he might think most advisable for their removal. A medical man in whose judgment confidence may be placed, will, under these circumstances, be able to soothe the afflicted mind, to dissipate imaginary apprehensions, throw oil upon the perturbed waters, and to effect more permanent relief than any which the patient could possibly expect to derive from those related to him by the dearest ties of consanguinity. In many of these cases, where the patient feels that he is "going mad,"—when the mind is beset by strange impressions, or is evidently sinking under the weight of morbid sensations, with which the person is in vain endeavouring to combat, a temporary separation from business and home—an exclusion from all mental and physical stimuli—will often restore the mind to a healthy condition, without there being any necessity for confining the patient in an asylum in company with patients much worse than himself, and whose ravings and insane vagaries would only tend to fix irretrievably the delusions on his mind. Awful is the responsibility which the medical man incurs, who incarcerates a person suffering from the premonitory stage of insanity within the awful barriers of a madhouse. Is this often done? it may be asked. I have no hesitation in replying that it is. It will require but little sagacity to indicate what the melancholy consequences are likely to be. Supposing a person to be exposed to the influence of those causes which are so often known to unhinge and unsettle the mind, and a temporary attack of mania results. Without attempting to re-establish mental health, the patient is placed under the protection of a keeper, and is taken to a madhouse. Perhaps in a few days the bodily disease gives way, and the mind manifests a disposition to return to its former state of health. It will not be difficult to divine what would be the emotions of a person possessing naturally a sensitive mind, when a restoration of reason took place, upon finding himself surrounded by patients afflicted with every degree of insanity? The awful imprecations of one—the wild incoherent rhapsodies of another—the oaths and curses of a third—must have a strong tendency to retard the healthy current of his thoughts, and to drive his mind into some permanent delusion. It has been said that Tasso, who was constitutionally of an impetuous temper, upon exhibiting an indication of mental unsoundness was locked up in a lunatic asylum, and by his confinement was driven mad. In making these observations, let me not be misunderstood. I should be sorry if it were supposed that I consider establishments for the exclusive reception and treatment of insanity as unnecessary, or an evil—I only wish to argue against their indiscriminate use. Do away with the strong prejudice which is entertained against madhouses,—obliterate the impressions made by the details given in evidence before a Committee of the House of Commons, with respect to the refined cruelties practised in institutions of this kind,—adopt a better system of classification,—do not compel the harmless lunatic to herd with the violent and excited maniac—and then we shall succeed in inducing persons who feel the slow and insidious approaches of deranged intellect to voluntarily subject themselves to a temporary deprivation of their liberty until the mind is capable of acting with healthy regularity. Should the individual who is conscious of having a tendency to insanity, and who experiences warnings of a coming mental storm, place himself under the roof of a medical practitioner who has made the treatment of this affection his peculiar study, and who will watch with care the varied condition of mental feeling which the patient may exhibit during the progress of the disease, much irretrievable misery might be prevented. But alas! how few possess the moral courage to confess to a stranger the morbid feelings which may be embittering their existence, and yet this is the period in which medical advice is followed by the happiest results. Let the disease progress—let the delusion fix itself upon the imagination, and be closely rivetted to the mind, and then, in numerous instances, how ineffectual will be the best directed efforts of the practitioner! The observations of the late Dr Reid on this important point cannot be too forcibly impressed upon the mind. That able and philosophic physician, when speaking of the "tendency to insanity," remarks, "that there are floating atoms or minute embryos of insanity which cannot be discerned by the naked or uneducated eye. One of the most important requisites in the character of a physician is the capacity of detecting the earliest rudiments and the scarcely formed filaments of disease, so that by timely care and well adapted means he may prevent them from growing and collecting into a more palpable and substantial form."

I am now only referring to recent or acute cases of insanity, evidently accompanied by marked physical disorder. That it is possible for a person to be insane and yet fit to manage himself and affairs, and to be at liberty, I do not for a moment question. In discussing the subject of confinement, it is not our duty merely to consider whether insanity be present or not in any given case, but whether the disorder of the mind incapacitates the person for the control of his own affairs. This is an important distinction to bear in mind. In giving evidence in a case of this kind we are not only called upon to attest as to the presence of mental derangement, but as to the degree of that unsoundness of mind, as far as it deprives the person of the power of self-direction. It is not because a man is unequivocally mad, that it follows as a necessary corollary that he is to be shut up in a madhouse. A patient who might only exhibit a little harmless vagary if permitted to possess his liberty, would most likely become violent and untractable were he compelled to associate with lunatics in an asylum.

On the subject of coercion I cannot speak in too strong language. How many miserable human beings, who would otherwise have been useful and honourable members of society, have been driven into permanent and incurable insanity by unkind and harsh treatment.

It is indeed astonishing to consider how much ignorance has existed on this subject. We find intelligent physicians recommending seriously the most harsh and cruel treatment towards the insane. Dr Cullen, the first physician of his day, observes, that he considers it necessary to inspire mad patients with a feeling of awe and dread of those who are to attend them, and that this is to be acquired by *stripes and blows !* Other medical writers recommend "flagellation" as a portion of the treatment necessary. But if medical writers have erred in recommending a system of cruelty towards lunatics, legal authorities have gone a step further. The following passage occurs in the work of Collins 'On Human Liberty.' "Furious madmen, whom all allow to be necessary agents, are, in many places of the world, either the object of judicial punishments, or are allowed to be *dispatched* by private men." It is stated by another authority, ('Burn's Justice,' vol. iii. p. 111,) that "any person may justify confining and beating his friend being mad." We refer to these medical and legal writers only for the purpose of showing what barbarous notions were formerly entertained with regard to the treatment of lunatics. It is not many years back since the insane in this country were subjected to most unchristian treatment. I refer the reader to the disclosures which were made before a Parliamentary Committee appointed for the purpose of investigating into the condition of the madhouses in England. The heart sickens at the recollection of the evidence then adduced.

The treatment of the insane on the Continent, until within the last few years, was inhuman in the extreme. Even at the present day many revolting cruelties are practised. The lunatics, confined in gaols whenever they became noisy, were condemned to the deepest and darkest dungeons. In Ghent the intractable were inclosed in wooden boxes or cages. Sir Francis Head states that at Eberbach a large iron cage is still used for confining refractory and dangerous lunatics.* "At Strasburg their dens were only four feet wide, and six feet in height. Through the spars was tossed the litter upon which the half naked maniac reposed ; food was conveyed to him in the same manner ; and from the ribald jest or harsh commands of the attendants, he had no protection ; he was indulged in neither darkness nor solitude ; his tormentors were ever before him. At Maréville the cages containing the patients were placed in cellars ; at Lille they were confined in subterranean holes ; at Saumur they inhabited cells without windows, and were provided with wooden troughs filled with oak bark as beds."† In alluding to the treatment of lunatics in Sicily, Galt observes, —"Several of the patients were fastened by chains fixed to iron collars round their necks, and sat at the grating of their windows like savage animals in cages."

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* 'Bubbles from the Brunnens of Nassau,' p. 290.

† J. Browne on Insanity.

On this subject I cannot do better than repeat what I have previously said,—that in the treatment of those who are unhappily afflicted with this affection, we should never lose sight of this fact, *viz.* that the mind in insanity is morbidly sensitive to all impressions which are made upon it; an unkind look or word often grates upon the feelings and aggravates the malady.

On the humane treatment of the insane, Dr Reid observes with great truth, that "in the management of mental affections, tenderness is better than torture, kindness more effectual than restraint. It takes less trouble to fetter by means of cords, than by the assiduities of sympathy and affection. Nothing has a more favourable and controlling influence over one who is disposed to, or actually affected with, melancholy or mania, than an exhibition of friendship or philanthropy; excepting, indeed, in such cases, and in that state of the disease, in which the mind has been hardened and almost brutalized, by having already been the subject of coarse and humiliating treatment."

In some cases of homicidal and suicidal insanity, actual coercion cannot be dispensed with. Were we not to subject such patients occasionally to a deprivation of their liberty, the most disastrous consequences would ensue. I cite the following as a case in point.

At the Norwich assizes, in the summer of 1805, Thomas Callaby was tried for the murder of his grandchild. A witness stated, that he found the prisoner sitting on the side of his bed, one morning in March, about 12 o'clock, after having dreadfully wounded his wife in different parts of her body. The prisoner's daughter brought down the child with its throat cut; the knife lay in the room. Upon being charged with the crime, the man observed, "I confess I did it, but I do not care anything about it. My wife has often heard me say I should certainly murder some one, and *I have often begged to be confined.*" It appeared that the poor man was conscious when his fits of madness were coming on; and that at these times he has been known *to tie himself down with ropes to the floor.**

In cases where the suicidal impulse is manifested, the greatest caution is necessary on the part of the practitioner, to prevent the commission of the act. Believing, as I do, that in these cases the mind is deranged, that the disposition to sacrifice human life is but a symptom of insanity, it is the bounden duty of the physician, when consulted as to the course which ought to be pursued when the suicidal propensity is exhibited, to recommend, if not immediate confinement, the exercise of strict surveillance. It is highly culpable on the part of the medical attendant to allow a person manifesting a wish to kill himself, to be at liberty to carry his morbid desire into execution at whatever time he may think proper. Can any thing be more absurd than the idea of considering a person haunted by the suicidal impulse, to be in the possession of a sane mind? In many cases, the patients themselves feel conscious that they are mad, and often for a considerable period struggle against the insane idea.

The suicidal impulse is often so overpowering, that the unfortunate person, in order to subdue it, is compelled to summon to his assistance all his mental energies. A religious hypochondriac, after having heard that a person committed suicide on Good Friday, observes, when detailing his own morbid feelings,—"Scarce had I heard the story, when I was seized with violent terror lest I should come to the same end on the same day. I could not behold a knife without shuddering; at dinner I grasped it with all my might, lest I should suddenly turn it against myself; and when I had cut my meat, I fed myself with my fingers. From an impulse that arose more suddenly than the passage of an arrow, I set to my throat, in idea, the pen I was holding, the knife with which I mended it, the tobacco pipe in my mouth, the snuffers, my sword, the church steeple opposite me. Between sleep and awake, methought the room was full of knives, and I fancied I heard the noise of their whetting." The same miserable hypochondriac says, "I had locks put upon my sashes, lest I should jump out of the window during the night."

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* Case of Pierre Laudart, 'Med. and Phys. Journ.' No. 88, p. 511.

Surely, in such a case as the one just related, confinement and coercion could not with safety be dispensed with. I do not maintain, that in all cases in which a propensity to commit suicide is exhibited, the patient should be subjected to incarceration; for I have had patients under my care suffering from this malady, whom I felt assured it would not have been prudent to imprison in a lunatic asylum. The medical practitioner, when consulted in a case of this kind, and when asked his opinion as to the propriety of seclusion, must be guided in his judgment by the particular circumstances of each individual case. No rule can be laid down which admits of universal application. I have seen cases of suicidal patients allowed to retain their liberty, who ought most unquestionably to be sent either to an asylum, or carefully watched by trustworthy attendants.

The notion that the suicidal impulse is in the majority of cases a purely mental act, unconnected with physical disease, has been productive of the most melancholy and fatal consequences. Medical men, and the public generally, have, with a few exceptions, been too much disposed to consider this subject as one coming almost exclusively within the domains of the metaphysician. The bodily disease which almost uniformly gives origin to the morbid perversion of the natural instinct of self-preservation, has been overlooked, and the unhappy person has been allowed, unprotected, to end by his own hands his miserable existence. Where no disease is suspected, no remedy will be sought. Tell a man who has attempted to slay himself, that he is perfectly sane—that his judgment is sound—that his will is not perverted—that the impulse which drives him to the commission of suicide is not associated with any deviation from corporeal health,—and you inculcate ideas not only fallacious, but most pernicious in their character and tendency. We might with as much truth tell a person playing with a lighted taper at the edge of a barrel of gunpowder, that his life is not in jeopardy, as to say to a person disposed to cut his throat, blow out his brains, poison or hang himself, that he is in the perfect enjoyment of health, and requires no moral or medical treatment. It may be laid down as an indisputable axiom, that in every case of this kind, bodily disease may, upon a careful examination, be detected. I never yet saw a case where a desire to commit suicide was present, in which there was not corporeal indisposition. Instead of inculcating the notion that this morbid propensity is independent of material lesion, it should be our constant endeavour, and in fact it is our duty, to establish the necessity of obtaining medical advice directly the idea of self-destruction takes possession of the mind. I have seen the most happy results ensue from adopting such a course of procedure. Patients have consulted me, complaining of being haunted by a desire to kill themselves, and I have invariably found them to labour under latent physical disease. "To know ourselves diseased is half our cure," is a wise maxim when applied to this subject. It ought to be our object to persuade those so unhappily afflicted, that the unnatural propensity is but the consequence of physical ailments, which are amenable to those medical principles which direct the practitioner in the treatment of other diseases. We ought to diffuse through society generally the notion that it is a matter of essential importance, that the patient whose mind is haunted by the idea of suicide should instantly subject himself to medical treatment. He should be informed that his feelings are but the effect of physical disorder, which can easily be removed if he will confide in the judgment of a medical practitioner. I have seen, in cases of this description, a strong and apparently uncontrollable suicidal impulse yield to a few simple remedies. The physician, when consulted in a case of suicidal mania, should carefully ascertain whether there be congestion of the brain or abdominal viscera. The latter affection is often present in this class of patients. The condition of the liver should also be inquired into. In the majority of cases that organ will be found in a morbid condition. Much may be done by medical treatment in cases of insanity attended by this symptom.

The practitioner should endeavour to obtain the confidence of the patient. It is often possible to reason or to frighten a person out of the desire to commit self-destruction. Suicides are generally cowards. The very act of suicide implies the absence of courage. If the medical man, when consulted in these cases, acts with firmness and resolution, he may often succeed in turning the current of morbid thought. I was once in the presence of a person who had attempted suicide. A friend of the party said to the patient sneeringly, "Pooh, you commit suicide? you have not the courage to do it—it is all nonsense and bravado; take this knife and cut your throat." Although I questioned the propriety of thus addressing the individual referred to, it had nevertheless a good effect: he never again attempted his own life.

Dr Darwin states that a gentleman, being apprehensive that his friend meditated self-destruction, obtained from him a promise that he would not do so before four o'clock the next day. He fulfilled his promise, but blew out his brains as soon as the hour was expired. A patient evidently bent on suicide, asked M. Falret for razors to shave himself with. Trusting to his knowledge of the case, M. Falret complied. This physician observes, "The patient, after having shaved, looked at me, and observing that I remained tranquil, he exclaimed, 'How well you know me!' From this time I had all his confidence." It is important to ascertain the presence of the early symptoms of suicidal mania; for in the premonitory stage, medical and moral treatment may be had recourse to with very great advantage. The experienced physician can easily detect the existence of suicidal mania. There is in these cases a peculiar expression of countenance, which constitutes an important diagnostic sign.

For some period before the individual manifests a morbid propensity to sacrifice his own life, the mind may have dwelt upon the idea of self-destruction. In some cases the impulse is apparently sudden in its development; but it will commonly be found, upon inquiry, that the notion of suicide has been haunting the imagination for a considerable time before the act is perpetrated or attempted. When the mind has been directed or engaged in a particular train of morbid contemplation for any length of time, the face assumes a peculiar cast, which is present in no other state of mental feeling. The practitioner who has had any experience in these cases, can easily detect the existence of the suicidal propensity. With the view to the prevention of self-murder, how important it is that the physician should make himself practically acquainted with this indication. Parkman relates that Lord M. having requested Stuart, a distinguished artist in London, to paint a portrait of his brother, a captain in the army,—he did so with great accuracy. When Lord M. saw the portrait, he exclaimed, "This is not the portrait of my brother,—it is the *portrait of a madman.*" The painter requested another sitting; his Lordship saw the painting again, when he observed, "*My brother appears more mad than before!*" Three weeks after the Captain blew out his brains!

In consequence of the melancholy suicide of several persons of distinction, the public attention has recently been painfully directed to the consideration of the question, whether it is possible by legislative measures to prevent the commission of this crime? I still entertain the notion which I have propounded in another work, that such enactments can do no good.

In a note attached to the report which appeared in *The Times*, of the coroner's inquest on the body of Lord Congleton, who killed himself, it is said that Mr Wakley considers that the crime of self-destruction should be punished with confiscation of the suicide's property. If such be his belief, how can it be reconciled with the remarks contained in his charge to the jury? The coroner, in allusion to the absurdity of supposing that verdicts of *felo de se* would have the effect of deterring persons from the commission of suicide, observed, that "he could not believe in the potency of any such practice; for he could not think that any one who did not care about rushing into eternity by his own act, or about mutilating or disfiguring his own body with a razor, rope, or poison, would be at all influenced by the thought of what they might do with his dead body." Neither do I think that the idea of having his property confiscated would have the slightest effect on the mind of a person disposed wantonly to sacrifice his own life. Were such a law to be enacted, it would only have a partial operation. Hundreds and thousands of persons who commit suicide, have no property to confiscate. But independently of this objection, it has clearly been established that the dread of such consequences has no influence on the mind strongly disposed to suicide.

In November, 1793, the National Convention of France decreed the confiscation of the property of those who committed self-destruction; not, however, with the view of preventing suicide, but for the purpose of enriching the public treasury. This enactment had no effect in staying the progress of the moral epidemic. Suicides were as common after the law passed as before. In opposition to this view, and in support of the notion that suicide can be prevented by an act of parliament, it has been urged that there are cases on record of persons who have been deterred from suicide by the dread of posthumous punishment. In cases where suicide has prevailed epidemically, it may have been possible to break through the diseased current of thought, by holding out a threat of ignominious punishment after death; but no argument can be deduced from this fact which would warrant the adoption of a general rule with reference to these cases. There are certain convulsive affections which have resulted from a morbid principle of imitation, for the cure of which it has been necessary to call into powerful exercise the passion of fear; but how absurd it would be for a medical man, when called in to a case of convulsions, to recommend the adoption of this remedy! It is only when the affection, either convulsive or suicidal, *is clearly epidemic in its character, and evidently the consequence of a morbid desire to imitate,* that an attempt ought to be made to frighten the person into a state of bodily and mental health.

I have said, however, more on the subject of suicide than I intended in this chapter. Before dismissing the consideration of the physical treatment of insanity, I would urge upon the attention of the faculty the importance of paying strict attention to the diet of patients labouring under this malady. In connexion with this subject I would refer, *en passant,* to a subject of paramount interest to all influenced by philanthropic and christian principles. I allude to the alarming increase of *pauper insanity* in this country. It is fearful to contemplate the extent to which this truly awful disease is devastating the ranks of the poorer classes of the community. Will it be credited, that out of 12,574 insane persons *ascertained* to exist in England, no fewer than 11,000 are paupers maintained at the expense of various parishes? As this fact cannot be doubted—as it is established by evidence irrefragable and conclusive,—it becomes the sacred duty of those who are considered to be the guardians of the public health,—as the natural protectors of the poor,—to investigate the causes of this calamity. I have no hesitation in asserting that this extension of pauper insanity clearly arises from the system of dietary adopted in establishments set apart for the maintenance of the poor. It is heart-rending to consider the sufferings, the privations, to which so large a mass of our fellow creatures are exposed. Deficient nutriment is a common cause of mental infirmity in its most melancholy and aggravated form, *viz.*—that of idiotcy! Can any other result be anticipated, when those who are delegated with official power are endeavouring, by a course of brutal experiments, to ascertain what is the *minimum* amount of food consistent with the existence of vitality? The principle upon which those act who are empowered with authority to carry out the enactments of the Poor Law Bill, is to drive the poor out of the workhouse, under the notion of compelling them to earn their own livelihood, by making the Union houses places of misery and wretchedness. The principle may be considered by some to be a sound one, but I much question whether the mode of carrying it out is in unison with those charitable and christian feelings which ought to influence our actions. It has been found that the most effectual mode of diminishing the number of paupers, is to give the inmates of these "Bastiles" the smallest quantity of food compatible with life. No rational, no thinking, no humane man, will have much difficulty in predicating the consequences of this inhuman course of procedure. Let those who entertain any doubt of the result, visit these moral pest houses, and examine into the condition of the poor confined within their walls. I have had frequent opportunities, having had the medical charge of establishments of this kind, of witnessing the sad effects of defective nourishment on the mental and bodily condition of those unhappily subjected to it. Perhaps, after all, we may be justified in considering the mental unconsciousness which results from this barbarous treatment, as a wise dispensation of that kind Providence which rules with unerring wisdom all that pertains to our condition in this world. The mind of these unhappy creatures becomes a wreck—so calculated is the system to which they are exposed to

—"crush the human frame,
And hide at once the figure and the name."

The statistical annals of lunatic asylums clearly proves that the mortality is greatest in those institutions where the food is the poorest; and that the recoveries are most numerous where the patients are allowed the indulgence of a generous diet.

Whilst I am writing on this important subject, perhaps I may be allowed, although it does not come strictly within the objects of this essay, to observe that medical writers have not considered in a manner commensurate with its great importance, the relationship between the diseases of the lower orders, and the excessive labour and defective nourishment to which they are compelled to submit. Deficiency of food is the principal cause of most of the maladies to which the poor are subjected. If it is difficult to point out many instances of persons who have actually died of starvation, (an admission which I am not at all disposed to make,) it cannot be denied but that thousands annually are hurried to a premature grave in consequence of physical deterioration caused by a want of proper nutrition. In France, according to M. Villermé, the rate of mortality among the poor sometimes doubles that of the rich. It has been computed, that in a poor district in that country 100 die, whilst in a rich department only 50 are cut off.

Having, in a previous chapter, referred to the moral treatment of mental affections, it will not be necessary for me again to dwell at any considerable length on this part of the subject. That much good may be done by moral treatment, few will entertain a doubt. In the management of these cases, we should never forget that it is often possible to subdue an unhealthy expansion of one mental faculty, by calling into active exercise other powers of the mind. I am much disposed to believe, with the late Dr Darwin, that, in the treatment of mental diseases, we do not sufficiently attempt to force, by frequent repetition, upon the disordered mind, ideas exactly the reverse of those by which it is disturbed. But this part of the subject is of too important a character to be discussed cursorily: I must reserve for another opportunity what I have to advance with reference to the prevention of insanity. I cannot, however, dismiss this subject without urging upon the attention of those to whose care cases of this description are intrusted, the necessity of throwing open the wards of public asylums to pupils engaged in the study of medicine. Under proper regulations, this could be adopted without any injury to the patients subjected to medical treatment, whilst at the same time it would be productive of a large amount of benefit to the public.

At present, all our public institutions devoted to the reception of this class of patients are almost hermetically sealed to the profession. It is true that a medical man finds no difficulty in gaining access to the interior of the building; but no clinical instruction is conveyed respecting the treatment of the numerous affections of the mind, which the medical practitioner is often called upon to treat in the exercise of his professional duties. I believe the day is not far distant, when those engaged in the study of medicine will have the advantage of attending a complete course of lectures on Psychological Medicine. That the institution of a professorship of this kind would be productive of much benefit to the faculty, few will deny: sure I am that it would tend to elevate the character of professional men in the estimation of the public, and earn for them the appellation, in its most liberal acceptation, of Medical Philosophers.

FINIS.

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